

**ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR**

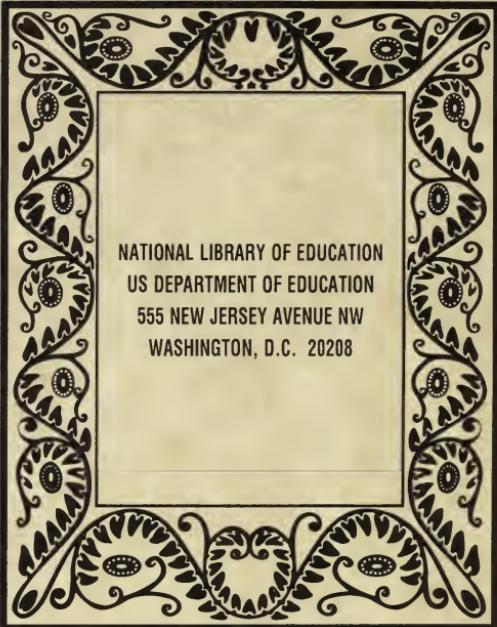
*for the FISCAL YEAR ENDED
JUNE 30* 1933

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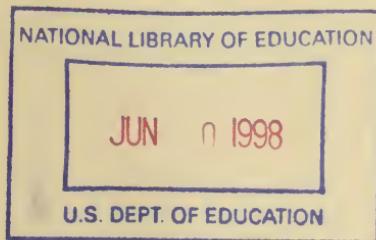


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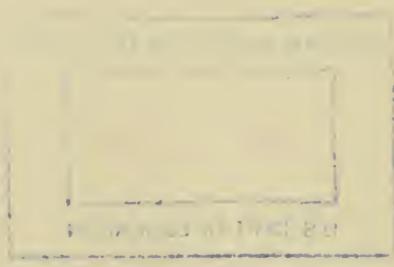
*ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR*

OF THE

FOR THE FISCAL YEAR ENDED JUNE 30
1933



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Annual report of the
Secretary of the Interior

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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 30, 1933.

SIR: I have the honor to transmit my annual report for the Department of the Interior for the fiscal year ended June 30, 1933.

Very respectfully,

HAROLD L. ICKES,
Secretary.

The PRESIDENT,
The White House.

*THE REPORT OF
THE SECRETARY OF THE INTERIOR
TO THE PRESIDENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1933*

The first annual report of a Cabinet officer assuming his duties with a new administration is necessarily brief, as the period covered is only from March 4 to June 30.

I will not attempt to interpret or give a résumé of the detailed reports of the various bureaus, divisions, and offices of the Department of the Interior contained herein. They will speak for themselves.

Under this administration several new administrative agencies have either been brought into the Department from other departments or have been newly created. These are:

The Bureau of Mines, retransferred from the Department of Commerce in anticipation of an Executive order to that effect to be issued later.

The Federal Board for Vocational Education which has been set up as a branch of the Office of Education.

The Office of Public Buildings and Public Parks of the National Capital.

The Soil Erosion Service.

The Subsistence Homesteads Division.

The Adviser on Economic Status of Negroes.

In addition to the foregoing, the Department of the Interior has been designated by the President as the Federal agency responsible for certain administrative duties under the petroleum code, and the Secretary of the Interior has been made administrator under the oil code as well as Administrator of Public Works. However, since all of these additional activities were brought under the jurisdiction of the Department subsequent to June 30, they are not discussed in this report.

The detailed reports of the various divisions of the Department have been materially cut down in volume in this report for reasons of economy. Full details of the activities of any part of the Department during the year covered by the report are available in the files of the Department to whomever may be interested.

THE SOLICITOR

The work of the solicitor's office shows a considerable increase during the fiscal year, notably in the matter of reports on proposed legislation, the number attaining a total of 982.

INDIANS

Two cases of outstanding importance affecting the jurisdiction of the Secretary of the Interior over the property of Indians of the Five Civilized Tribes in Oklahoma were decided by the Court of Appeals of the District of Columbia on April 3, 1933, namely, *King v. Ickes* (64 Fed. 2d, 979), and *Ickes v. Perry* (64 Fed. 2d, 982). The purpose of both suits was to compel the Secretary to release large sums of money held by him belonging to Indians of the Five Civilized Tribes of one half or more Indian blood. These funds were the proceeds from leases of restricted lands. The restrictions having been removed from the lands, it was contended that this operated to remove the restrictions from the funds. The decision of the trial court in one case was for and in the other against the Secretary. Appeals were perfected; and while the cases were before the appellate court, Congress enacted the act of January 27, 1933 (47 Stat. 777), section 1 of which declared that all funds then held by or which might thereafter come under the supervision of the Secretary belonging to Indians of the Five Civilized Tribes of one half or more Indian blood are restricted, and that all such moneys shall remain subject to the jurisdiction of the Secretary until April 26, 1956. The Court of Appeals ruled in both cases that this enactment applied to the funds involved in the pending suits and made them restricted and subject to the jurisdiction of the Secretary irrespective of whether the property was theretofore restricted or unrestricted.

IRRIGATION—BOULDER DAM PROJECT

Federal irrigation development by the Bureau of Reclamation and the Office of Indian Affairs continues to entail legal problems. During the year 12 cases were taken to the United States Circuit Court of Appeals for the Ninth Circuit and were decided in favor of the United States. The construction of Boulder Dam and appurtenant works, with a contemplated expenditure of \$165,000,000, produces many legal problems; and these come to the solicitor's

office. Complicated specifications and attendant contracts are examined, while purchase contracts of large magnitude must be passed upon. Questions involving conflicting rights between the States and the United States in the construction of the Boulder Canyon Project have been numerous. In the establishment of Boulder City and its government, questions of law have arisen concerning construction of waterworks, public buildings, streets, establishment and maintenance of schools, a police force, and the trial of cases involving misdemeanors.

OIL, GAS, AND OIL SHALE

Under the oil-conservation policy which became effective March 13, 1927, no oil and gas prospecting permits were issued. On April 4, 1932, the Department approved regulations providing for the issuance of permits on conditions giving the Department wide control over drilling and production as provided in the act of March 4, 1931. The result has been renewed activity in permits. In cases where these have been denied, appeals have been taken to the Secretary and have been considered in the office of the solicitor. The order of August 6, 1932, that the volume of oil produced be measured without deduction, except for the actual percentage of impurities, has had far-reaching effect.

The validity of the requirement that annual assessment work be performed in oil shale placer claims is before the office in a number of appeals from the decision of the Commissioner of the General Land Office. A suit for injunction restraining the Secretary from taking proceedings against these claims because of default in annual assessment work is now before the Court of Appeals of the District of Columbia.

WAR MINERALS RELIEF

During the year the office has actively participated in the trial of a number of cases arising under the War Minerals Relief Act of March 2, 1919, selected for hearing because they involved questions whose determination would enable the solicitor to dispose of other pending suits. The outstanding cases finally determined were two which involved the claim of the Chestattee Pyrites & Chemical Corporation. These cases were before the Court of Appeals of the District of Columbia and the Supreme Court of the United States several times, and were finally settled in accordance with the mandate of the Supreme Court. In the first of these cases (no. 335, decided January 16, 1933), the Supreme Court held that in claims presented under the War Minerals Act as amended February 13, 1929, purchase of equipment, salaries paid to executive officers, and similar items, might properly be included. In the second case (no. 767, decided May 29, 1933), the Supreme Court sustained the Secretary of the Interior in declining

to pay interest, amounting to over half a million dollars, claimed to have accrued after the enactment of the act of March 2, 1919, which permitted interest to be charged. Fifty-eight war mineral cases remain to be determined by the Secretary of the Interior. Four cases are now before the courts on appeal. The most important is *Ickes v. Cuyuna Mining & Investment Co.*, which probably will be heard by the Court of Appeals of the District of Columbia during its October Term. This case involves the question of the assignability of war minerals claims.

OTHER MATTERS

The reorganization of Federal functions has brought to the Department of the Interior additional activities—notably in the new establishment of the Office of National Parks, Buildings, and Reservations—which present for consideration many legal problems not heretofore within the assignment of the duties of the solicitor.

The following table shows work performed in the office:

Table showing work performed by office of the solicitor during fiscal year ending June 30, 1933

	Public-land matters		Indian matters	Miscella- neous mat- ters
	Appeals	Motions		
Pending July 1, 1932.....	220	9	9	17
Received during year.....	811	111	11,951	9,821
Total.....	1,031	120	11,960	9,838
Disposed of during year.....	621	104	11,938	9,825
Pending June 30, 1933.....	410	16	22	13

“Miscellaneous Matters” include the following:

Formal opinions by the solicitor.....	61
Reports on legislation.....	982
Contracts for the erection of buildings, for building of roads, for supplies.....	1147
Cases prepared for submission to the Board of Equitable Adjudication.....	892
Oil and gas matters:	
Leases.....	23
Prospecting permits:	
Reinstated.....	9
Granted.....	1,149
Assignments.....	127
Extensions of time.....	1,466
Cancelled.....	436
Coal matters:	
Prospecting permits.....	84
Licenses.....	32
Leases.....	35
Potash matters:	
Prospecting permits.....	78
Leases.....	3

WAR MINERALS RELIEF COMMISSION

(Roscoe Fertich, Commissioner)

The Secretary of the Interior under section 5 of the act of March 2, 1919 (40 Stat. 1272) was authorized to adjust, liquidate, and pay certain losses suffered by persons by reason of producing or preparing to produce certain minerals in compliance with the request or demand of named agencies of the Federal Government.

This act was amended February 13, 1929 (45 Stat. 1166) authorizing the Supreme Court of the District of Columbia to review the decisions of the Secretary of the Interior upon questions of law, with the usual right of appeal; but providing, also, that "the decision of the Secretary of the Interior on all questions of fact shall be conclusive and not subject to review by any court."

Under this amendment 337 petitions were filed, of which 5 have been dismissed by the court, and 173 decrees, mostly by consent, have been referred to the Secretary of the Interior for review. On June 30, 1933, 159 cases were pending in the court. At the beginning of this fiscal year there were 62 decrees pending action by the Secretary of the Interior; and, in addition, 52 decrees were handed down during the year. Under these decrees, 56 cases were considered, of which 53 resulted in awards, 2 in disallowances and one in a decision from which an appeal has been taken. There are 58 cases remaining for consideration by The Secretary of the Interior at the end of the fiscal year.

CONTROLLING COURT DECISIONS

The United States Supreme Court in the *Vindicator-Chestatee*, decided December 7, 1931, held that a claim under the act might properly include the purchase of property (land) and interest to March 2, 1919, on money borrowed and lost in operations; and, in the (second) *Chestatee*, decided January 16, 1933, held that expenditures for salaries of officers, legal services, taxes, and expenditures prior to stimulation were permissible; and, in the (third) *Chestatee*, decided May 29, 1933, held that interest paid or accrued was allowable only to March 2, 1919.

BUREAU OF RECLAMATION

(ELWOOD MEAD, Commissioner)

The area irrigated in 1932 with water from Government works was 2,769,605 acres, a decrease of 77,002 acres over that of 1931.

The area cropped was 2,775,280 acres, an increase of 3,096 acres.

The total value of crops was \$50,158,381, a decrease of \$23,801,996 compared with 1931, and of \$69,503,439 compared with 1930. This decrease in crop values was due largely to the agricultural depression and the prevailing low prices of crops.

During the period 1906, when water was first available, and to and including 1932, the cumulative value of crops grown on land irrigated from Government works amounted to \$1,886,048,258.

Construction payments in cash and credits from power and other sources received during the fiscal year 1933 were \$887,460.68, a decrease of \$616,990.75 compared with the previous year.

Payments for operation and maintenance were \$1,138,403.19, an increase of \$30,694.66 compared with the previous year.

Total payments amounted to \$2,025,863.87 compared with \$2,612,159.96 in 1931, a decrease of \$586,296.09.

Income to the Bureau from all sources during the fiscal year was \$4,688,255.57, or \$711,059.37 less than in the previous year.

The operation expense for the year was \$1,127,394.40, a decrease from the previous year of \$321,795.34.

Excess of operation and maintenance receipts over expense for the period amounted to \$11,008.79 compared with an excess of expense over receipts of \$341,481.21 for the previous year.

The appropriation available for construction was \$4,060,198.

The amount expended on construction was \$3,488,034.62 compared with \$7,255,188 the previous year.

Reduced revenues coming into the reclamation fund have brought about a sharp reduction in construction activities and unless some means be found for resuming work on a more extensive scale, funds that have been spent on storage works and canal systems will remain tied up until projects have been completed and water made available for the irrigable lands, and until water can be furnished, the Government is not in a position to call for the return of the construction costs. In other cases there is urgent requirement for the construction of storage reservoirs to provide additional water for well-developed

projects that are handicapped because of a shortage particularly after the middle of July.

The Boulder Canyon project comes under a separate authorization and appropriations for this work are made direct from the General Treasury. The Bureau has expended for surveys and investigations, construction, operation and maintenance, and incidental operations, \$278,500,000, distributed approximately as follows:

Surveys and investigations not allocated to primary projects-----	\$2, 900, 000
Construction of irrigation works, etc-----	226, 500, 000
Operation and maintenance-----	36, 900, 000
Incidental operations, plant and equipment, etc-----	12, 200, 000
 Total-----	 278, 500, 000

The relief acts of April 1, 1932, and March 4, 1933, granting to water users on Federal projects a suspension of payment of construction charges that became due in 1931, 1932, and 1933, resulted in a further reduction in reclamation revenues. Accretions to the revolving fund from the sale of public lands was \$293,863.78, which is a shrinkage of about one third of the revenues received from this source in the previous fiscal year, and from oil leases \$1,833,721, an increase of \$404,449. As a result of reduced revenues the appropriations available for carrying on work in the fiscal year 1934 are estimated as follows:

Direct appropriations-----	\$3, 003, 000
Unexpended balances continued available-----	1, 485, 245
Power revenues-----	405, 000
Funds to be advanced-----	539, 746
 Total available-----	 5, 432, 991

THIRD YEAR'S PROGRESS ON BOULDER CANYON PROJECT

Construction progress on Boulder Dam has been continued at the same rapid pace that characterized the work during the first 2 years and at the end of the year the contractor was approximately 18 months ahead of the original schedule. The river was diverted through the 50-foot tunnels in November 1932, the cofferdams completed during the winter months, the foundation excavation completed in the spring, and the first concrete placed on June 6. The contractors have planned to place the mass concrete in the dam—3,400,000 cubic yards—in 23 months, which is 9 months less than the time allowed in the first estimate.

The principal contracts awarded during the year covered the installation of the 150-ton permanent cableway by the Lidgerwood Manufacturing Co., the price being \$172,110. The Westinghouse Electric & Manufacturing Co., of East Pittsburgh, Pa., was awarded a contract for furnishing eight plate-steel cylinder gates, 34 feet in

diameter, for the intake towers, their bid being \$334,737. The Goslin-Birmingham Co., of Birmingham, Ala., has the contract for supplying entrance liners and other appurtenances for the intake-tower gates at a price of \$56,000. On February 3, 1933, bids were opened for furnishing hydraulic apparatus for the Boulder power plant, including four 115,000-horsepower and one 55,000-horsepower, vertical shaft, hydraulic turbines, with governors. The Allis-Chalmers Manufacturing Co., of Milwaukee, Wis., was awarded a contract for the four large wheels at \$1,087,600, and the Newport News Shipbuilding & Dry Dock Co., of Newport News, Va., was the successful bidder for supplying the small wheel at \$124,684. The Woodward Governor Co., of Rockford, Ill., is furnishing the five governors at a price of \$60,605.

At the end of the year specifications were being prepared for the furnishing and installation of four 82,500-kilovolt-ampere and one 40,000-kilovolt-amperes vertical-shaft alternating-current generators for the Boulder power plant. During the year 859,500 barrels of cement were purchased. A combination of four southern California mills—the Riverside Cement Co., California Portland Cement Co., Southwestern Portland Cement Co., and the Monolith Portland Cement Co.—furnished 782,000 barrels, while the Union Portland Cement Co., of Denver, Colo., was given a contract for 77,500 barrels.

CONSTRUCTION ON RECLAMATION PROJECTS DURING FISCAL YEAR

On the Owyhee project, Oregon, construction work has been in progress throughout the fiscal year. Owyhee Dam and the two long tunnels at the head of the canal system were completed. Contracts have been awarded for the first 10 miles of the main canal and good construction progress has been made. The Cle Elum Dam, on the Yakima project, Washington, was 94 percent completed at the close of the fiscal year. This is a rolled-earth and gravel-fill dam 135 feet high, 770 feet long, with a reservoir capacity of 435,000 acre-feet of water. On the Kittitas division of this project the Wippel pumping plant was completed and also the Badger Creek wasteway, while on the Kennewick division the Prosser Canal and power plant were put into operation. A power plant was also completed on the Grand Valley project in Colorado. On the Minidoka project, in Idaho, work was continued on the enlargement of the South Side Main Canal and lateral extensions on the Gooding division.

Drainage work was continued on the Sun River project, Montana; Rio Grande project, New Mexico-Texas; Klamath project, California-Oregon; Belle Fourche project, South Dakota; and the Willwood division of the Shoshone project, Wyoming. During the year 76 miles of canals and 109 miles of drains were constructed, making the total

to date 17,808 miles. The construction work at Boulder Dam increased the number of tunnels from 142 to 190 with a distance of 260,841 feet. There were 1,665 new canal structures built, 75 bridges, and 355 culverts. The Bureau has laid 4,792,055 feet, or 908 miles, of pipe; completed 1,498 miles of road, 120 miles of railroad, 4,086 miles of telephone lines, and 3,587 miles of transmission lines. Building these numerous canal systems has required the excavation of 319,004,119 cubic yards of earth and rock, and the placing of 5,651,168 cubic yards of concrete, in which 6,502,636 barrels of cement have been used.

ECONOMIC DEPRESSION

Farmers on Federal reclamation projects have felt the depression with a force equal to that experienced in other agricultural sections. One encouraging exception, however, is noted on the sugar-beet projects where the crop is contracted before planting and where is known within reasonable limits what is to be paid at harvest time. The average value of crops grown on all Federal projects in 1932 dropped to \$20.69, which is the lowest average during the entire existence of reclamation activities. Fortunately, there is very good evidence at hand to show that the bottom has been reached and that we have started on the upgrade. Early in the spring of 1933 there was a substantial increase in the price of dairy products, wool was being contracted at about double the price received the year before, the price of cotton had advanced, and, with increased prices being received from livestock, there was a corresponding increase in the selling price of alfalfa. The prospects for better prices for the 1933 crop were very promising, particularly for potatoes and beans, which are two of the important cash crops on northern projects.

A brief statement as to general trends in crop production during recent years gives some idea of the contribution of Federal reclamation to the agricultural life of the country and particularly to the unimportant part it plays in increasing the agricultural surplus. The area cultivated remains approximately four tenths of 1 percent of the total cropped area of the United States and about 1 percent of the value of all crops. Wheat has been decreasing in area and the production is now about three fourths of what it was 5 years ago. Cotton has also fallen off to approximately one half of the 1928 area. On the other hand, irrigated pastures, alfalfa, barley, and oats have been increasing year by year. These are the crops that are consumed on the farm and do not enter into competition with crops produced in humid sections. Potatoes and fruits have shown both increases and decreases in area and production during recent years, but the general trend has been upward. Sugar beets, also noncompetitive, which have shown an increase in area during the past few years, are still about

7 percent less than the maximum of 1929, although the average yield has increased about 25 percent.

Federal reclamation has furnished an important market for the sale of manufactured products in the 43,377 irrigated farms with a population of 181,007, and 227 cities and towns with an additional population of 515,423, which in large part have resulted from the construction of these projects.

MORATORIUM FOR WATER USERS

The act of April 1, 1932, granted to water users on Federal projects a moratorium on the construction charges that became due in 1931 and one half of the charges that became due in 1932. As the economic conditions that justified this moratorium still continued during the calendar year 1932, it was evident that further relief would have to be extended to the water users. A meeting of the Federal Irrigation Congress was held in Boise, Idaho, September 1-2, and resolutions were passed recommending a continued suspension for a term of 3 years, without interest, of payments on construction and other charges due the United States on Federal projects and that said charges, together with accrued interest, as well as interest that became due under the act of April 1, 1932, be deferred to the end of the contract repayment period on the projects. Several bills providing for relief were introduced in the Congress and hearings were held on January 25-27 before the Senate Committee on Irrigation and Reclamation, and on February 23 before the House Committee on Rules. Under date of March 3, 1933, Congress passed an act extending the provisions of the act of April 1 to include the remaining half of the charges due for 1932, and all similar charges to become due in 1933, such deferred charges to bear interest at the rate of 3 percent per annum, which rate was to apply to charges deferred under the first act which, by regulation of the Secretary, provided for interest payments at the rate of 5 percent per annum.

This moratorium resulted in a marked reduction in receipts to be credited to the reclamation fund and limited the amount appropriated by Congress for continuing the construction work, exclusive of sums carried over from previous appropriations, to \$2,065,000, which is about one third of the amount that would have been available under normal conditions. In order to offset this difference and give opportunity to continue work on the few projects that were not completed, an act was approved on May 12, 1933, which authorized the Reconstruction Finance Corporation, upon request of the Secretary of the Interior, to advance funds in an amount not exceeding \$5,000,000 for construction of projects or divisions of projects now under construction or approved and authorized. The funds so advanced were

to be repaid out of any receipts accruing to the reclamation fund within 5 years of the date of advance, with interest at 4 percent. It has not been necessary to take advantage of the provisions of this act nor is it expected that such action will be taken. The National Industrial Recovery Act approved June 16, 1933, authorized an expenditure of \$3,300,000,000, and plans were made for carrying on construction work on Federal projects with funds to be allotted by the Public Works Administration.

ADJUSTMENT CONTRACTS

MILK RIVER PROJECT, MONTANA

Contracts amendatory of the 1926 repayment contracts with the Malta Irrigation District and the Glasgow Irrigation District were entered into September 10, 1932, and September 20, 1932, respectively, which provided principally for adjustment of payments during the life of the original contracts. In spite of the very great reduction in the amount to be repaid during 1932, very few water users were able to meet the first payment due, and it was necessary that all districts accept the provisions of the moratorium act.

YAKIMA PROJECT, WASHINGTON

Adjustment contracts under the act of May 25, 1926, were completed with the 3 of the 6 small irrigation districts under the Sunnyside division of the Yakima project which had not previously contracted for extending the time for payment of construction charges. These districts were the Grandview, Snipes Mountain, and Outlook. The relief granted these six districts permits them to carry on without taking advantage of the act of April 1, 1932. However, at the end of the fiscal year four of these districts had filed applications accepting the amendatory act of March 3, 1933. The Sunnyside Valley Irrigation District secured relief under the original act, as did also some 80 percent of the individual water users on the Tieton division. Inasmuch as the charges covered by the amendatory act are not 12 months in arrears, little interest has been manifested in this act up to the close of the fiscal year.

SHOSHONE PROJECT, WYOMING

A supplemental contract dated June 3, 1933, was voted and signed by the Deaver Irrigation District, permitting the district to retain its construction collections during the next ten years and use them for additional drainage construction, which is badly needed. This district has a crop repayment contract, so that the period of repayment is automatically extended.

On April 12, 1933, a contract was made with the Shoshone Irrigation District whereby the district is relieved of paying construction assessments on State-owned land within the district which may not by law be subject to assessment by the district.

PROJECT SETTLEMENT ACTIVITIES

During the fiscal year 190 public land farm units, comprising a total irrigable area of 11,699 acres, were opened to entry as follows:

August 22, 1932, Lower Yellowstone Project, Montana-North Dakota, 4.
January 3, 1933, Belle Fourche Project, South Dakota, 2.
February 2, 1933, Pavilion and Pilot divisions, Riverton Project, Wyoming, 69.
March 4, 1933, Kittitas Division, Yakima Project, Washington, 47.
May 17, 1933, Gooding Division, Minidoka Project, Idaho, 68.

Owing to the depressed financial condition prevalent on a large majority of the projects there was little to encourage settlement of the vacant public lands. Results, however, would seem to justify the recital of a few exceptions to this rule.

On the Belle Fourche project the season of 1933 showed a satisfactory increase over that of 1932 in point of new settlers and in the area under cultivation, and although there was an absence of much needed capital, the settlers were improving their farms, their indebtedness was inconsequential, and they were able to face the future with confidence.

There was much demand for the farms on the Kittitas division of the Yakima project, and from January 1 to the close of the fiscal year 30 families located in the valley. Of the 47 farm units opened to entry on March 4, 88 applications had been received to June 30, and 38 of these applicants made entry.

Irrespective of economic conditions similar to those existing on the other projects, the Riverton project closed the fiscal year with the addition of 12 carefully selected settlers.

In spite of the low prices received for farm products on the reclamation projects, in general the morale of the settlers has not been seriously disturbed, and in the realization that their condition compares favorably with that of farmers in other sections of the country where crop prices have been at an exceedingly low ebb, they have taken on new hope and have determined to fight the depression to a finish.

CONTRACTS

The following summary shows the nature of the contracts entered into by the Bureau during the fiscal year, their number, and the amounts involved:

Nature of contracts	Number of contracts	Amount involved
Cooperative investigations.....	2	\$24,000.00
Supplies.....	529	755,243.21
Material.....	184	898,098.11
Equipment.....	96	1,622,113.41
Miscellaneous services.....	101	39,213.14
Construction work.....	24	11,336,316.56
Land purchases, including improvements.....	66	167,947.73
Land sales, including improvements.....	6	806.20
Leases to the United States.....	21	11,422.55
Leases from the United States.....	418	141,518.95
Compromise of damages.....	11	2,031.14
Rental of Government equipment.....	6	799.00
Rental of water.....	325	175,248.44
Sale of surplus electrical energy.....	49	121,688.12
Sale of water rights to towns.....		
Sale of water rights under the Warren Act.....	1	469.20
Sale of water rights within projects.....	8	4,961,184.12
Adjustment and relief.....	1	(1 ²)
Transfer of project operations.....	1	
Miscellaneous.....	106	70,996.37
Total.....	1,955	\$ 20,329,096.25

¹ This represents contract with Shoshone Irrigation District, Shoshone project, Wyoming, covering suspension construction charges unsold State lands.

² Deferments under moratorium acts of Apr. 1, 1932, and Mar. 3, 1933, not included under this item.

³ Estimated in part.

ECONOMIC AND ENGINEERING OPERATIONS

SALT RIVER PROJECT, ARIZONA

The effects of the prolonged economic depression have been severely felt in all activities, rural, urban, and suburban, throughout the project and vicinity. Construction was practically at a standstill during the year, the State's largest industry, copper mining, was almost completely shut down, and the prices of agricultural commodities were the lowest of record. There was no advance in agricultural development and no market for farm property, or, for that matter, any other kind of property.

The collapse of the mining industry seriously affected an important market for farm products in the mining towns, and the shutting down of the mine plants cut off one of the most important markets for hydroelectric power from the project system. These revenues, formerly depended on to defray a considerable part of operation, maintenance, and overhead expenses, had to be made up by direct assessments. Under the circumstances banks were more conservative in extending credit, resulting in some increase in the amount required to be provided in cash for current financing, over normal times. The meeting of current expenses, plus a large floating indebtedness would undoubtedly have resulted disastrously for many landowners, but for a loan of \$880,000 from the Reconstruction Finance Corporation, made on notes signed by the individual shareholders, endorsed by the association as an organization. This enabled the association to pay its outstanding notes, and to acquire the stock of the locally

organized "Agricultural Credit Finance Corporation", with a paid-up capital of \$350,000, which sum was thus made available for crop and water loans to association shareholders. This relief undoubtedly saved many farms from foreclosure.

The increase in water stored in the four reservoirs on Salt River and in the underground gravels tapped by the project irrigation pumps, which resulted from the river flow of early 1932, made it possible to discontinue pumping during that year, except as needed for drainage. Failure of fall and winter rains to follow this run-off, however, made it advisable in 1933 to again draw heavily on the irrigation pumps in order to conserve surface storage waters. As a result, at the end of June 1933 the quantity stored was still 1,000,000 acre-feet, approximately 250,000 acre-feet less than at that date in 1932. This is a fairly satisfactory condition, assuring an adequate reserve at the end of the time of heavy use, September 30, with possibility that fall and winter run-off may reduce the amount required to be pumped in 1934.

YUMA PROJECT, ARIZONA-CALIFORNIA

The slight advance in prices received for farm products, particularly during the last 6 months of the fiscal year, and the more economical methods of farming which of necessity were adopted by the farmers, contributed to the slight improvement in the general financial condition of the project water users over that of last year. The relief from reclamation charges afforded by the acts of April 1, 1932, and March 3, 1933, has been of very material assistance to water users. Additional relief in the form of reduced operation and maintenance charges, made possible by the drastic economies practiced by the Bureau, has also been of assistance.

A preliminary survey now indicates that approximately 14,000 acres have been planted this year, as compared to 9,918 acres in 1932, 18,895 acres in 1931, 28,073 in 1930, and 36,029 in 1929. Of this year's crop, approximately 3,000 acres have been signed up for destruction under the plan of the Cotton Administration of the Farm Relief Act.

Under the contract of February 5, 1931, the Yuma County Water Users' Association makes all collections from individual water users in the valley division, containing 47,372 irrigable acres. As of June 30, 1933, the association had paid all O. & M. bills for the division, and had cleared for water, having paid in advance all individual assessments due, 42,579 acres, or 90 percent of the lands in the division. Of the 13,467 acres in the Reservation division, 93 percent are eligible for water at this time.

ORLAND PROJECT, CALIFORNIA

The unfavorable economic conditions of the previous year continued to a greater degree throughout 1932 in that prices for all farm products, with but few exceptions, were lower. As a result of an ample water supply, crop yields were uniformly high, but prices were ruinously low.

Collections of reclamation charges, aggregating \$52,285, compared favorably with those of the preceding year (which were only \$3,500 more), especially in view of the low prices received for farm produce generally and the fact that payment of nearly \$69,000 of construction charges was deferred under the relief act of April 1, 1932.

The crop value of \$24.43 per acre for 1932 is the lowest in the 22 years of the project's operation with the exception of the drought year of 1924. Farm equipment depreciated about 25 percent in value, while values of livestock decreased over 50 percent, owing partly to a reduction of nearly 500 cows among the dairy herds of the project.

Reduction in available funds made it mandatory to curtail concrete lining operations on the project to 450 linear feet of laterals subject to excessive loss of water and high maintenance cost. Broken control parts on the 42-inch needle valves at Stony Gorge Dam were replaced.

GRAND VALLEY PROJECT, COLORADO

There were 459 farms irrigated during the 1932 irrigation season. The average crop value per acre was \$16.26 as compared with a 10-year average of \$35. This extremely low return was caused entirely by low prices for all farm products. Yields were normal for the year and sufficient irrigation water was available for all needs. The average water user has adapted himself to the changed conditions and has cut his cost of production to the minimum.

A number of land transfers were made by local people during the year at very low prices. The price of farm lands ranged from \$5 to \$75 per acre depending on the soil qualities, improvements, location, etc. The beet-sugar factory at Delta processed all beets grown in the territory, and the Grand Junction factory remained idle. Sufficient acreage was contracted for the 1933 season to insure the operation of both factories.

During the year the Grand Valley power plant was constructed at a cost of approximately \$209,000. All funds in this connection were advanced by the Public Service Co. of Colorado and the plant was turned over to the company for operation on April 1, 1933.

UNCOMPAGRE PROJECT, COLORADO

During the 1932 irrigation season 1,592 farms were irrigated. Of this number 782 were farmed by owners and 810 by tenants.

The average crop value per acre was \$11.84, which was only about one half the previous lowest return in the history of the project. This ruinously low return was due entirely to low prices received for agricultural products. All principal crops brought the lowest returns of record, with the result that no general project revenue was available from any source. A few farms were transferred by purchase and others by foreclosure, but no settlement activity was noticeable. The price of farm land ranged from \$25 to \$150 per acre, depending upon the quality of the soil, improvements, and location with reference to shipping points.

BOISE PROJECT, IDAHO

Farmers on the project have been handicapped by low prices for produce. Prunes, apples, and potatoes on many ranches were left unharvested because of lack of demand. As a result, farm financing has become a problem. There have been few sales, but a fair demand for rentals. Cooperatives have been active. The project continues to produce diversified crops and dairy products, with about half the project acreage in alfalfa hay and pasture.

KING HILL PROJECT, IDAHO

There were 122 farms on the project operated by owners and 70 by tenants. There has been an increase in the demand for rented farms, but in too many cases by persons without sufficient funds and equipment to carry on farming operations.

As a result of the poor market for potatoes in 1932, there was a reduction in acreage this year, with a demand for early potatoes that was encouraging, although shipments had been limited to the markets that could be reached by trucks. There has been an increase in the area of small grain and all crops are looking better than in 1932. Alfalfa that survived the freezing weather is doing well, but much of this crop was killed during the long and very cold winter months.

The canal system is in need of the replacement of some important structures comprising siphons, repairs to concrete flume floors, and headgates on the main canal.

MINIDOKA PROJECT, IDAHO

There were 2,384 farms irrigated on the old divisions of the project as compared with 2,285 during the preceding year. The number of irrigated farms is divided between the gravity and pumping divisions in the proportion of 1,522 on the former and 862 on the latter. There was little change in tenantry, about 40 percent of the farms being operated by tenants and 60 percent by the owners. Sales of farm property were comparatively few and prices were only fair.

Most crops produced good yields in 1932, but prices were very low. The total crop value was \$1,444,575, or an average of \$14.50 per acre. Sugar beets, with an average yield of \$78 per acre, proved to be the most profitable crop. Most of the other farm products, however, especially potatoes, declined in price to such an extent that they yielded little or no profit. In spite of these conditions, collection of operation and maintenance charges on both the gravity and pumping divisions has been gratifying. Most of the construction charges either have been postponed or have been paid out of power profits.

It is estimated that 30,242 acres on the Gooding division were irrigated with water from American Falls Reservoir, there being 134,000 acre-feet of storage delivered to these lands. As a result, the water supply for lands both above and below the Milner-Gooding Canal was more than doubled and the crop yields increased accordingly.

BITTER ROOT PROJECT, MONTANA

The money loaned by the United States to rehabilitate the project has had a most encouraging effect. During a number of years the uncertainty as to whether the project could finance itself to reconstruct many old wooden structures had caused much land to become tax delinquent to the extent that it was taken over by the county. During the past year many new settlers have purchased these lands in small tracts and are building their homes. These people are coming from the mining and dry-farming regions. There is also evidence of new building and other improvements by the original landowners.

The prices prevailing for farm products have reduced the farmers' income in most cases to less than the cost of production and, notwithstanding lower overhead expense, a condition making difficult the meeting of water assessments has resulted. Employment of landowners on new construction work helped the tax payment situation to some extent. The district's income from water charges was 60 percent of normal. The Bitter Root Irrigation District has an irrigable area of 18,240 acres. In 1932 there were 227 farms with 15,374 acres of land cropped and irrigated, a slight increase over the preceding year.

HUNTLEY PROJECT, MONTANA

During the 1932 irrigation season 649 farms were irrigated. Of this number 324 were operated by owners and 325 by tenants. The general population trend, back to the farm, held true for the Huntley project. The annual census showed an increase in the farm population of 513 during the year and an increase in the town population of 80, making a total increase for the project of 593.

The average crop value per acre in 1932 was \$24.84, which is the lowest in the project's history with the exception of 1921. The water supply was adequate at all times and yields were good, the

low value being due to depression prices. Sugar beets were the principal cash crop and provided 72 percent of the total income from the farms. The yield of this crop was 2 tons per acre above the average.

MILK RIVER PROJECT, MONTANA

The year of 1932 was favorable for crop production and yields were somewhat above normal. The general low price level of all farm produce, however, resulted in a crop revenue far below that of several years past. The sugar-beet acreage was the largest and yields were the best in the history of the sugar industry on the project. Although an unusually low price was received by the farmers for beets, this crop was the only one that yielded a profit to the producer.

Contracts, amendatory of the 1926 repayment contracts with the Malta and Glasgow irrigation districts, were executed during the year, which provided principally for an adjustment of payments during the life of the original contracts. In spite of the very great reduction in the amount to be repaid during 1932, very few water users were able to meet the first payment due, and it was necessary that all districts accept the provisions of the Moratorium Act.

About 80,000 tons of sugar beets were refined by the Chinook factory of the Utah-Idaho Sugar Co., which constituted the greatest volume of any campaign in the life of the industry upon the project. Slightly over 10,000 acres are contracted for 1933, which, with the crop prospect now in sight, should yield a tonnage at least equal to the capacity of the mill, during a normal operating season. Major repairs to the plant are being made, however, which are designed to increase its daily output, and it is anticipated that the crop can be handled without difficulty.

SUN RIVER PROJECT, MONTANA

The program followed since 1929 of changing the large grain acreage to alfalfa, sweetclover, forage, and cultivated crops was continued during 1932. Good progress was made as evidenced by the fact that at the end of 1932 there were 2,561 acres in sweetclover, 12,716 acres in alfalfa, 400 acres in potatoes, 100 acres in corn, compared to the year 1929, when there were 1,148 acres in sweetclover, 4,893 acres in alfalfa, 43 acres in potatoes, and none in corn. In 1933 considerable interest was aroused in the raising of sugar beets and 80 acres were contracted. That the nearest sugar factory at Chinook now has more than 10,000 acres under contract and the freight charge from the Sun River project amounts to about \$1.30 are indications that a factory will have to be located near the project before sugar-beet raising can be extensively adopted.

The Fort Shaw division was successfully operated by the Fort Shaw Irrigation District. The Greenfields and Big Coulee divisions

as well as the main canals and storage works were operated in an efficient manner by the Greenfields Irrigation District. During the last half of the calendar year 1932 the W. H. Puckett Co., of Boise, Idaho, constructed 16.2 miles of drains which were urgently needed to protect and reclaim lands from waterlogging. Additional drainage work should be done in the very near future to protect additional lands from waterlogging.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

There were 481 irrigated farms on the project. In addition 54 farms were wholly dry, with small returns. The area irrigated was 31,235 acres, which was about the same as the previous year. The total area assessed for charges was about 44,000 acres. This figure includes roads, laterals, and farmsteads, so it is probable that an area of about 6,000 acres susceptible of irrigation was not being irrigated. A large percentage of this acreage is very undesirable for irrigation.

During the current year 55.3 percent of the irrigated farms were operated by owners or managers compared to 54.7 percent the previous year. No attempt has been made to encourage settlement owing to the depressed agricultural condition. The irrigation districts made no sales of lands taken over for nonpayment of taxes. Two contracts for sale were canceled and one farm was purchased because of the nonpayment of taxes.

In spite of the low prices received for farm products the financial record of the district was satisfactory. Both districts raised sufficient money to keep the operation and maintenance work on a cash basis.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The run-off of the North Platte River for 1932 was slightly above normal and the irrigation water supply was ample. The area irrigated was about the same as that of the previous year. All of the irrigation districts, except Pathfinder, delivered water to all lands not in arrears for more than 2 years in the payment of water charges, and this policy no doubt resulted in a larger area being watered than would otherwise have been the case. Yields of all crops, with the exception of potatoes, which were poor in quantity and quality, were normal or better. Prices received for all farm products were low. The price paid for sugar beets at the time of harvest was \$4 per ton. An additional payment of about 40 cents per ton was made in June 1933 and a small additional payment may be made if the price of sugar remains favorable. On account of their previous good financial condition, all of the irrigation districts, except Northport, were still on a cash basis. Power credits and the moratorium acts have taken care of construction payments. The Northport district continues

to be in a precarious financial condition and additional assistance is needed.

The only construction work undertaken by the Bureau was the building of approximately 11 miles of 33,000-volt transmission line between Lingle power plant and the town of Torrington, Wyo. This line was about 75 percent completed at the end of the fiscal year. The irrigation districts excavated 13 miles of new drain ditches for the protection of irrigated lands.

NEWLANDS PROJECT, NEVADA

The water supply was ample for irrigation of lands in the Carson division, but the extremely low elevation of Lake Tahoe and a deficient run-off into the Truckee River necessitated the purchase by the irrigation district, at heavy expense, of privately owned stored water in Donner and Independence Lakes for use on bench lands under the Truckee Canal during the 1932 season. In order to prevent a shortage of irrigation water for the Fernley and Hazen districts after July 15, 1933, negotiations were again in progress at the end of the fiscal year for a similar purchase. The installation of a pumping plant to pump water from Lahontan Reservoir into the lower end of the Truckee Canal for irrigation use on the Swingle Bench area was undertaken. Run-off in the Truckee and Carson Rivers was retarded and greatly reduced during the spring of 1933 on account of cold, unfavorable weather.

The irrigated area on farms totaled 44,304 acres, in addition to which 7,623 acres in outside community pastures received some regulatory and drainage waters for irrigation. Farms operated by owners numbered 525 and by tenants 182. During the year the directors of the district authorized the sale of water rights for a number of small tracts of privately owned land upon which drainage and other district charges had been assessed, but no new water-right applications were completed. Crops with a total estimated value of about \$516,500 were harvested during 1932. This was a decrease over the crop value of the preceding year of \$222,500, although the yields were considerably greater. Alfalfa production, stock feeding, and dairying continued to be the major agricultural pursuits.

Faced with the prospects of another severe water shortage on the bench lands, the board of directors of the district on May 1, 1933, authorized the construction of the Lahontan-Swingle Bench pumping plant. The installation of this plant, at a cost of approximately \$11,000, was completed on June 30. The capacity of the plant is about 70 cubic feet per second and the equipment comprises two 20-inch centrifugal pumps and motors. Operation of the plant was commenced on July 9, 1933, water being pumped from Lahontan Reservoir, through connections with the 78-inch power penstock, into the lower end of the Truckee Canal.

CARLSBAD PROJECT, NEW MEXICO

There were 438 farms cultivated during the year, of which 279 were cultivated by owners or managers and 159 by tenants. The total area irrigated was 24,760 acres. Prices of farm lands ranged from \$100 to \$250 per acre. There were no farms sold during the year. About \$650,000 was borrowed from the Federal land bank. Considerable difficulty in meeting mortgage payments was experienced by farm owners and the delinquency at the close of the year was about 60 percent. Crop yields for 1932 averaged \$19.59 per acre, or \$10.67 less than the low value of the previous year and the lowest since the early years of the project. Financial conditions were serious throughout the year. The local bank deposits as of June 30, 1933, were \$460,000. Very few loans were made by the local bank and none for crop production. Loans totaling about \$60,000 were made by the loan agencies of the Government, namely, the so-called "seed loan" and the "agricultural credit agency" of the Reconstruction Finance Corporation. Prices for staple crops had improved at the end of June.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

Practically all of the project is in private ownership and approximately 90 percent was in cultivation. The number of irrigated farms increased from 4,496 in 1931 to 4,557 in 1932. However, the cropped area was reduced from 137,378 to 134,531. This reduction in area was brought about by lack of finances among the water users. Only 2,846 farms, or 62 percent, were farmed by the property owners, and 1,711, or 38 percent, by menagers and tenants. The farms average from 60 to 120 acres in size. However, the average size is reducing every year, owing to subdivision of properties into suburban tracts near El Paso.

Crop financing has become more difficult to obtain through private sources each year and as a result the Federal seed and other Federal loan agencies have been freely used to finance the 1933 crops. The financing of these crops on the whole is an improvement over the previous year even though the general depression and economic conditions have not improved. The area contracted for irrigation on June 30 this year was 131,826 acres as compared to 110,298 acres on the same date last year. The irrigation districts are issuing special permits to users to receive water and on June 30, 1933, there were 10,598 acres receiving water in this way as compared to 36,661 acres on June 30, 1932. The condition of the banks is very good. One of the project banks was closed for about 6 weeks after the revised banking laws became effective in March of this year.

There were 4.07 miles of intercepting drain constructed in the Elephant Butte Irrigation District in connection with levee recon-

struction during the year. This will provide drainage for about 200 acres and will furnish flood protection to the adjacent lands of a much greater area. In the El Paso County Water Improvement District No. 1, there was constructed 3.28 miles of spur drain which will furnish complete protection for about 600 acres that were only partly protected by the existing drains.

BAKER PROJECT, OREGON

Construction of this project was approved by the President March 18, 1931. The plans provided for furnishing a supplemental water supply to an area of 7,000 acres of land in lower Powder River Valley, about 18 miles northeasterly of Baker City, Oreg., already settled and partially served with water from canals diverting from Powder River. The lands are now farmed to the limit of the available water supply, and the increased crop production to result from the supplemental water supply will, it is believed, be reflected in an increase in crop values much larger than the cost of the proposed irrigation works.

UMATILLA PROJECT, OREGON

Since the reclassification and cancelation of certain lands within the district in the east division, the irrigable area amounts to approximately 10,940 acres, for which the distribution system is prepared to deliver water. The area irrigated is about 7,300 acres.

Although the operation and maintenance assessment was reduced by 20 percent over that of 1931, payment of this charge in the west division would have been impossible for three fourths of the farmers had they not received seed loans. Many head of livestock were sold at a very low price in order to avoid further losses in feeding. Turkeys alone paid a small margin over feed costs.

VALE PROJECT, OREGON

Public Order No. 6, issued March 23, 1933, established water rental charges for the irrigation season of 1933, for the Harper and Little Valley, Bully Creek West Bench, and Bully Creek East Bench units. Good progress was made by the settlers despite the unfavorable conditions which obtained during the past year. Approximately 5,000 acres were seeded to crops by 118 settlers during the season and development of new lands continued. About 2,000 acres of land now in sagebrush were contracted for purchase during the last month of the fiscal year. With few exceptions the farms are being operated by the owners. Crop yields have been good, but prices were low for all farm products and there was no sale for onions and potatoes.

The Vale-Owyhee Land Settlement Association continued to function throughout the year, being active in securing a number of new settlers on the project. The advertising conducted by the association

in conjunction with the On-to-Oregon advertising campaign of the Oregon State Chamber of Commerce resulted in the receipt by the association of 1,050 inquiries and calls at the office of the association and the project superintendent of about 200 interested persons. No cooperative associations have yet been formed on the project. Two excellent highways traverse the project and a State highway extends through the project lands.

KLAMATH PROJECT, OREGON-CALIFORNIA

The main division of the project contains 578 farms, 526 of which were farmed during the calendar year 1932. Of the farms irrigated, 379 were cultivated by owners and 147 by tenants. In the Tule Lake division there were 321 farms, of which 296 were operated by owners and 25 by tenants. No difficulty has been experienced in getting settlers for lands in the Tule Lake division and on the 68 farm units containing 4,752 acres of irrigable land, opened October 16, 1931, under Public Order No. 28, there were 185 qualified applicants, a few of whom showed assets in excess of \$10,000 each; the majority, however, had \$3,000 to \$6,000 worth of property, most of which was in equipment and stock.

In 1932 crop yields were about average, but net returns were unsatisfactory, as prices for all farm commodities were the lowest in years. Alfalfa hay sold for as low as \$3.50 per ton during the winter, but jumped to \$10 late in the spring of 1933, after all had been sold. Fat steers sold for 3½ cents, while hogs sold for as low as 1½ cents. With these low prices prevailing, farmers found it impossible to meet their obligations. However, owing to the recent rise in the market prices of farm products and the general upward trend of business conditions, there is now a feeling of optimism among the farmers.

On the enlargement of the first 9 miles of the J Canal, excavation was completed from station 0 to station 445+40, 7 bridges were rebuilt, and 38 minor structures modified to meet the requirements of the enlarged canal section.

OWYHEE PROJECT, OREGON-IDAHo

During the fiscal year ending June 30, 1933, the project was brought from 58 percent to about 63 percent completion.

The General Construction Co. contract for the Owyhee Dam was completed in October 1932, 4 months ahead of schedule. Grouting of the contraction joints is to be done by the Government when the heat in the mass concrete has been lowered to mean annual temperature, probably in the spring of 1934. Gates in the dam were closed December 8, 1932, and 150,000 acre-feet of water stored before the release of Owyhee Ditch water began lowering the reservoir.

Work on the inlet end of Tunnel No. 1 was concluded in December, 1932, but clean-up of camp and plant was deferred until award of contract for the controlling works. The lining of the inlet, construction of portal, trash rack, and controlling works was awarded to Connolly in December 1932, and concreting begun immediately. By the end of the fiscal year the work was completed and ready for final payment. The outlet end of Tunnel No. 1 was practically finished in May 1932, 16 months ahead of schedule, and the clean-up around the portal of Tunnel No. 5 was done in 1933, the lining having been finished in February 1932, 20 months ahead of stipulated time.

Construction of the North Canal to station 242 + 20 and structures was carried on during the fiscal year, the contract being completed in April 1933, on time. The contract for the open cut, stations 29 + 45 to 36 + 35, was finished in September 1932, and the lining of Tunnel No. 3 and the approach tunnel to Owyhee River siphon in October, 7 months ahead of schedule.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Economic conditions were noticeably improved during the fiscal year, largely as a result of better prices received for commodities and the favorable crops produced in 1932. The wool clip of 1933 brought 25 cents per pound as compared to 10 cents the previous year, and the bonus on sugar beets amounted to 55 cents per ton in addition to the regular payment of \$5 per ton received late in 1932. Butterfat doubled in price, moving up from 10 to 20 cents per pound. Wheat reached a low of 19 cents per bushel in 1932, but was quoted locally at 73 cents at the close of the fiscal year.

The 1932 crops were valued at \$601,121, the lowest since 1924, but the decrease resulted entirely from low unit values, since yields in nearly all cases were considerably above the previous year. Sugar beets averaged 11½ tons per acre, while many growers reported 16 tons per acre or better and the total value of the crop reached \$325,000, which was more than all other crops combined. Corn, oats, and barley, the principal feed grains, yielded 600,000 bushels, or nearly three times the production of these grains for 1931.

A contract between the United States and the Belle Fourche Irrigation District was executed May 2, 1933, under which a small pumping plant, costing \$6,500, is to be constructed for supplementing the water supply of the Johnson lateral, a canal dependent on direct flow. Work began June 14 and the plant was about 75 percent completed at the end of the month.

SALT LAKE BASIN PROJECT, UTAH

Weber River division.—The use of storage water during 1932 from the newly constructed Echo Reservoir increased the gross value of all crops at least 25 to 30 percent. This is the first year that a full

water supply has been available for the division during the entire irrigation season. The storage water has proved to be particularly valuable for late season use where the main crops are sugar beets, fruits, vegetables, berries, and alfalfa. It has also made possible the growing of more of the intensified crops and less wheat and other grains. The lands of the division are mostly in small ownerships. A large percentage of the farmers live on their farms. The remainder live in the adjoining towns and cities. Along with the growing of crops, dairying and stock raising are important industries.

The division is well supplied by a large number of fruit and vegetable canning factories, several fruit-packing plants, 3 sugar factories, 3 or 4 creameries, and 1 meat-packing and by-products plant. Most of these factories and plants operated during 1932, although business in many cases was below normal. In the case of the sugar factories, however, the number of tons of sugar beets received was larger than for the preceding 5 or 6 years. The receipts from the sale of such crops as sugar beets, fruits, and vegetables resulted in a good economic condition being maintained in the farming districts. As far as known no farms were abandoned during the year and mortgage foreclosures were limited to a very few.

The value of farm crops varied from \$2 per acre for poor pasture to \$137 per acre for asparagus and grapes. The average crop value for the division was \$29.11 per acre. There was an increase in the acreage of higher-priced crops due to the availability of storage water.

STRAWBERRY VALLEY PROJECT, UTAH

The project members, as a whole, are experiencing the most acute water shortage since the project was first utilized in 1918. The effect upon crops is, of course, adverse, and in many cases settlers are being forced to abandon a portion of their planted crops in order that water be reserved for late irrigations to mature the balance. Alfalfa-hay production is materially less than the production of 1932, and sugar-beet tonnage will not reach the 1932 production figure, even in view of the 1933 increase in acreage planted.

In view of the almost constant and steady decrease in the average number of acre-feet of water delivered under the project since completion in 1918, it is very important that water be conserved to a most stringent degree.

The first step along that line resulted from the interchange contract with the Utah Power & Light Co., completed July 18, 1931, for the intersale of electrical energy. Such connection provides a complete breakdown service, furnishes an outlet for surplus power generated, and entirely eliminates the practice of drawing water from reservoir storage for the single purpose of power generation during consumption peaks. The second step in the direction of

improving the available water supply is the proposed cancelation of water-right contracts covering marginal and nonirrigable lands. This procedure, if carried out, will increase the water supply applicable to the remaining contracts in force.

OKANOGAN PROJECT, WASHINGTON

The population of the project remains practically unchanged. There was a small decline in the irrigated acreage during the past year, comprising unfit areas and orchards that had suffered permanent injury through drought. Approximately 90 percent of the project farmers have negotiated for loans to carry on their season's operations during 1933, either through the Intermediate Credit Bank or the Regional Agricultural Credit Corporation. The return for the 1932 apple crop was very poor and the Government loan agencies have preserved the solvency of the district. The project is assured of the largest supply of gravity water since 1921.

Approximately \$6,000 was spent during the fall of 1932 and spring of 1933 in concrete lining of the main canal, where seepage loss was excessive. Two thousand two hundred and fifty linear feet of canal were lined with 3 inches of concrete which involved the placing of 386 cubic yards. Six old wooden weirs were replaced with concrete. Future plans call for installation of about 10 miles of 4- to 12-inch pipe line to replace lines in poor condition, and elimination, wherever possible, of high checks in order to conserve water.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton Divisions.—There were 86,639 acres irrigated in 1932 on the Sunnyside division, comprising 3,403 farms, or 24 more than for the previous year, of which 2,163 were operated by owners and 1,240 by tenants. Total values of crops declined 28 percent from the previous year under the handicap of low prices. Alfalfa continued the principal crop in area and total value. Although distressingly low in price, dairy and poultry products proved to be the stabilizing factors.

The irrigated acreage on the Tieton division increased to 26,100 acres, a gain of 1 percent, although the number of farms declined further from 1,330 to 1,320, of which 84 percent were operated by owners. Apples remained the principal crop in both acreage and total value. The acreage in bearing orchard increased from 17,402 to 10,002 acres, or 9 percent. The returns on fruits, comprising 71 percent of the gross area cropped, amounted to \$775,536, representing a decline of 63 percent from the 1931 valuation.

At the beginning of the 1933 season unpaid operation and maintenance charges for 1931 on the Sunnyside and Tieton divisions were 57 and 64 percent, respectively, of the totals. A large pro-

portion of the delinquent payments were finally made, so that practically all lands previously cultivated were receiving water at the close of the fiscal year. Funds for this purpose have been secured from Government loan agencies by direct application and also through various fruit organizations. In order to assist them in raising funds to meet their operation and maintenance payments, water users were given employment on operation and maintenance work to the greatest possible extent.

In addition to the regular operation and maintenance work on the two divisions, including removal of silt and repair and replacement of canal and lateral structures, a small program of betterments was continued on the Tieton division. Improvement consisted of replacement of three steel flumes with concrete lining and pipe lines, involving 409 linear feet of 46-inch redwood stave pipe, 480 linear feet of 30-inch reinforced concrete pipe, and 400 linear feet of reinforced concrete canal lining. Studies were made and preliminary plans and estimates prepared for increasing the water supply for this division.

Kittitas Division.—Water was delivered in the spring of 1933 to 50,442 acres of irrigable land lying under the Main, North Branch, and South Branch Canals of the Kittitas Division. This water was delivered to 71 landowners under the Main Canal, 120 under the South Branch Canal, and 440 under the North Branch Canal, all of whom have signed for water deliveries with the Kittitas Reclamation District. The Bureau of Reclamation is operating the project during the calendar year 1933, under appropriate contract, for the Kittitas Reclamation District, the entire cost of operation being paid in advance by the district. The Northern Pacific Railway Co. and its subsidiary, the Northwestern Improvement Co. have sold, at the appraised valuation, all but 300 acres of their irrigable lands. On March 4, 1933, there were 47 farm units opened to entry and 88 applications had been received to June 30, 38 of whom made entry. Three were pending action of the examining board and 47 had either been rejected or declined to accept the farm units offered. Seven hundred and fifty inquiries were received concerning the 47 tracts opened and the 26 other units to be opened later. There are on file in the project office approximately 500 names of inquirers to whom will be sent the new order opening the 26 tracts later in the year.

Kennewick Division.—The Kennewick Irrigation District continued the operation of its pumping plant, serving, however, only about 2,600 acres of a total of 4,000 acres. Under existing economic conditions, settlement of the additional area is expected to be slow. Development is further retarded on account of the necessity for removing many of the apple orchards and replanting to other crops, such as soft fruits, berries, asparagus, etc., to which the district is

better adapted. The district is requesting a more favorable contract for purchase of power to lighten the annual charges for a few years in order to encourage settlement. The construction of the power canal and 4,200-horsepower hydroelectric power plant at Prosser was completed on August 31, 1932. The diversion works are located at the Prosser Dam, which was acquired under the terms of a contract with the Kennewick Irrigation District. The canal is about 2.4 miles in length and has a designed capacity of 1,100 second-feet.

Storage division.—Satisfactory progress was made on the construction of the dam for the Cle Elum Reservoir by the contractors. At the close of the fiscal year the work was about 94 percent finished and the time 73 percent elapsed. The embankment, which was the principal feature of the work, was practically completed at the close of the year. The stilling basin for the combined outlet for spillway and tunnel was completed before winter. Storage capacity for about 150,000 acre-feet was provided for the season of 1933 under the control of two emergency butterfly gates. A capacity of 360,000 acre-feet will be available in 1934. The full capacity of 435,000 acre-feet will require the installation of the spillway gates.

RIVERTON PROJECT, WYOMING

The season of 1933 showed a satisfactory increase over 1932 in the number of settlers and in the area under cultivation. Most marked is the increase in area of excellent stands of alfalfa. There is also a substantial increase in the number of cattle and sheep on the project. Although the settlers have little money, they are all improving their farms. They owe little and face the future with confidence. The maintenance work has been done almost exclusively by settlers, a policy which has assisted them in paying irrigation assessments. The water-rental charge for the current year has been paid for all land previously irrigated and the books show no delinquent water charges. A considerable number of new settlers is already assured for 1934.

SHOSHONE PROJECT, WYOMING

The project water supply was ample and production was about on a par with former years. The prices received have steadily declined so that the returns for the 1932 crops showed a decrease of 25 to 30 percent from those of the previous year. The average per acre gross returns ranged from \$12.09 on the Garland division to \$4.48 on the Willwood. Shipments of agricultural products totaled 1,373 carloads compared to 1,651 the previous year, and livestock shipments were 107 cars compared to 91. At the close of the year quotations on nearly all crops and livestock had made decided advances and while the farmers had little left to sell, the outlook for 1933 was decidedly more optimistic.

New construction was limited to the Willwood division and consisted of 2.91 miles of lateral extensions, 1.04 miles of open drain, and 1.59 miles of tile drain with the necessary structures. Temporary transmission lines, 5.25 miles in length, were required. A large flume on the Willwood main canal was damaged by unstable foundation conditions. This was repaired by lowering some of the piers, extending the length of the flume 25 feet, and building a new concrete inlet and head wall.

At the Shoshone Dam and power plant one of the 48-inch emergency valves in the line leading to the power house was broken and this required installation of a new shell. One of the two power pipes leading through the base of the dam was thoroughly cleaned and painted. New trash racks were installed at the inlet of each pipe. The 58-inch balanced irrigation valves were repaired by electric welding where cavitation had occurred on the valve bodies and throat liners. The concrete lining in the outlet tunnels leading from these valves was also repaired.

SECONDARY INVESTIGATIONS

Funds for the investigation of prospective projects and kindred work are derived from appropriations by Congress, from contributions by States and other organizations for expenditures by the Bureau of Reclamation, and by direct payment by States and other organizations to personnel operating under the direction of or in cooperation with the Bureau. Additional data became available for the use of the Bureau as the result of work by other agencies wholly independent of the Bureau's activities, involving the expenditures of large amounts which are not reported to the Bureau. Federal funds for work done during the past fiscal year as hereinafter described were available from the acts of March 26, 1930; May 14, 1930; July 3, 1930; February 14, 1931; March 4, 1931; April 22, 1932; and March 4, 1933. Of \$160,370.57 disbursed by the Bureau during the past fiscal year, including \$77,033.83 for work under section 15 of the Boulder Canyon Project Act, \$143,733.81 was provided by the United States.

CALIFORNIA

All-American Canal investigations.—Prior to April 1933, a small amount of preliminary investigations was carried forward in assembling available data on silt carried by the Colorado River at the Imperial Dam site and minor consideration was given to methods for its disposal.

In April 1933 following the availability of \$25,000 from the Second Deficiency Appropriation Act for the fiscal year 1933, silt studies and investigations were outlined involving determination of present silt load at Laguna Dam and efficiency of Yuma project desilting works,

silt inflow from washes between Parker and Imperial Dam sites, character and extent of river bed deposits which are likely to be eroded from the stream channel between the Parker and Imperial Dam sites, stream cross-section and silt content for various Colorado River discharges at Imperial Dam site, and the best cross-section for the All-American Canal to prevent excessive scour or fill. Field work on these investigations was well under way at the close of the fiscal year.

On June 9, 1933, a contract was executed with the Imperial Irrigation District providing for investigations, surveys, estimates, and preparation of plans and specifications covering the construction of that portion of the proposed All-American Canal from Pilot Knob through the sand hills. The contract contemplates maximum expenditures of \$20,000 all to be advanced by the district.

Sacramento-San Joaquin investigations.—Data were assembled and field and office studies continued on plans for an initial development to relieve present distressed conditions in the upper San Joaquin Valley. Volume I, which is a general description of the results of investigations and reports made by the State of California on initial and ultimate developments for the Great Central Valley and in particular the Upper San Joaquin River, was prepared and authorized for release. Volume II, which covers work done by the Bureau of Reclamation on plans for an emergency project for the relief of the Upper San Joaquin Valley, is in the course of preparation.

For use in connection with the Bureau report on an emergency project, preliminary designs and estimates were prepared for a reservoir of 400,000 acre-feet capacity at the Friant site on San Joaquin River, a reservoir of 355,000 acre-feet capacity at Folsom on American River, including power plants at each site, the San Joaquin-Kern County Canal with initial capacity of 3,000 c.f.s. and length of 120 miles from Friant Reservoir to Tulare-Kern County line, Madera Canal with capacity of 1,500 c.f.s. and length of 20 miles from Friant Reservoir to Fresno River, and Sacramento-San Joaquin cross-cut channel with a cross-sectional area of 3,000 square feet and a length of 9 miles along Snodgrass Slough from the Sacramento River to Mokelumne River.

IDAHO

Crane Creek project.—A preliminary examination was made during September 1932 of the works and lands comprising this project to determine the desirability of conducting investigations looking to the rehabilitation of the Washington County Irrigation District. Some repairs are needed at the Crane Creek storage dam, the canal and distribution system would need to be reconstructed, and a short feed canal would need to be built from Little Weiser River to Crane Creek to augment the water supply for the reservoir. The lands would need to be reclassified to determine the economic feasibility of rehabili-

tating the project. With unavoidably high construction and operating costs, threatening project feasibility, and in view of the lack of funds for construction in case the project should prove to be feasible, it was concluded that detailed investigations were not justified.

Twin Falls—Oakley project.—The Oakley project is located in Goose Creek Valley, a tributary of Snake River, in Cassia County, Idaho.

The project works, consisting of a reservoir with a capacity of 74,000 acre-feet and a canal system to irrigate 40,000 acres, were constructed during the period 1909 to 1913 by the Twin Falls-Oakley Land & Water Co. Water supply proved inadequate for the 40,000 acres proposed for irrigation and much reduction in area has taken place. The construction company became insolvent.

Upper Snake River storage investigations.—Reconnaissance surveys were made of the watershed of Henrys Fork and its tributaries and of the canyon section above Alpine, Wyo., of the South Fork of Snake River to locate possible reservoir and dam sites. Much of this region is inaccessible and aerial pictures were secured with the cooperation of Army fliers to facilitate the investigations. A geological examination was made of the possible sites and the more promising ones were surveyed in detail. A preliminary geological report covering 14 of the reservoir sites examined was prepared in January 1933.

Reservoir topography was taken at the following reservoir sites: Shotgun Creek site on Henrys Fork; Boone Creek, Squirrel Meadows, and Wyoming Creek sites, on tributaries of Fall River; and Trail Creek and Teton Creek sites on tributaries of Teton River. Dam-site topography was taken as follows: Teton Canyon site on Teton River; Mountain Ash, Bechler Meadows, Grassy Lakes, Lake of Woods, and Canyon Creek sites on Fall River tributaries; and Dry Creek and Station Creek sites on South Fork of Snake River.

Location surveys were made for reservoir feeder canals as follows: From Cascade Creek to Grassy Lakes site, Bechler River to Wyoming Creek site, Squirrel Creek to Squirrel Meadows site, and Fall River to Boone Creek site. A canal line was also located from Henrys Fork to serve canals diverting from Fall and Teton Rivers. Reconnaissance surveys were made to determine the possibilities of transmountain diversion from adjacent watersheds to the Henrys Lake drainage basin.

Further work on these investigations has been suspended pending receipt of funds from local interests to pay one half of the costs after January 1, 1933, in accordance with the provisions of the law.

NEVADA

Humboldt River investigations.—A total of 144,000 acres are irrigated from Humboldt River and its tributaries, exclusive of Little Humboldt River, which is no longer connected with the main stream.

Investigations were undertaken to determine the feasibility of improving the present deficient water supply. An inspection was made of known reservoir sites, such as the North Fork, Devils Gate, South Fork, Upper Maggie Creek, Lower Maggie Creek, Rock Creek, and Oreana, for which maps are available. Topographic surveys and geological investigations were made of the Imlay, Callahan, and Rye Patch Dam and Reservoir sites on Humboldt River near Imlay. Argenta Swamp was investigated with a view of draining the swamp and improving channel conditions in that vicinity to conserve water wastefully evaporated.

OREGON

Grants Pass Irrigation District.—A brief inspection, with report dated September 24, 1924, was made of the Grants Pass Irrigation District to determine the advisability of conducting investigations on reconstruction and extension of project works and the paying ability of the district.

The district is largely devoted to suburban type of agriculture with holdings averaging 5 acres. Irrigation growth have been small but steady and now amounts to 6,500 acres. The distribution system is adequate for the present area, but may eventually need improvement by concrete lining of canals or pipe lines to reduce water losses to a minimum. Operation and maintenance costs are high on account of power purchased for pumping, necessity of delivering water to small holdings, and repairs to the canal system occasioned by floods and slides along the steep side hills on which they are located. The future agriculture of the project is uncertain and additional investigations are not warranted at this time.

Brogan project investigations.—The Brogan project was built in 1910 and consists of two reservoirs on tributaries of Willow Creek and a canal system to serve about 20,000 acres. The water supply from Willow Creek has been disappointing and the irrigated area has shrunk to about 2,000 acres, in part dependent for water on pumping from deep wells at a high cost. A preliminary water-supply study has been made to determine the surplus water available from Burnt River and as soon as the investigations are authorized an engineer will be assigned to investigate the feasibility of developing and bringing such waters into the the Willow Creek watershed.

Baker secondary project.—A reservoir is desired on Powder River to supplement the supply for about 25,000 acres of developed lands at Baker, the supply usually failing about July 1. The Oregon Legislature, together with individuals and counties of the interested area, has arranged for an advance of \$8,500 to pay one half the cost of the requested investigation, but a start thereon awaits decision by the Comptroller General as to availability of Federal funds.

UTAH

Cache Valley project.—On January 3, 1933, a petition was filed with the Cache County Commissioners for the organization of the Wellsville-Mendon Conservation District to furnish water for lands not already included in an irrigation district or served by a canal company. After the usual legal procedure prescribed by the laws of Utah, on June 5, 1933, the district was organized by a practically unanimous vote and a board of directors was selected to act officially for the district in negotiations for the formation of the water users' association which will contract with the United States for construction of project works and of which the district will be a stockholder. The favorable vote was due largely to a careful delineation of district boundaries to include only landowners desirous of project water as determined by canvass.

Ogden River division.—A report on these investigations was completed in August 1932. The report covers a lower-valley development and an upper-valley development, both with water from Ogden River.

The lower-valley development contemplates the construction of an earth and rock-fill dam just below Huntsville on Ogden River to form a reservoir with a capacity of 38,000 acre-feet; relocation of highways around the reservoir; reconstruction and enlargement to a capacity of 280 c.f.s. of 4½ miles of pipe line of the Utah Power & Light Co. from the Huntsville Dam site to the mouth of Ogden Canyon; construction of the south Ogden High Line Canal, with an initial capacity of 35 c.f.s., from the mouth of Ogden Canyon to a point south of Ogden City, a distance of 8 miles; and construction of north Ogden High Line Canal, with an initial capacity of 120 c.f.s., from the mouth of Ogden Canyon to Brigham City, a distance of 23 miles. The cost of this development is estimated as \$2,693,000. The project would furnish 6,000 acre-feet of storage annually to Ogden City for municipal purposes, provide a supplemental supply for 14,700 acres of irrigated lands, and furnish a full irrigation supply for 4,520 acres of new lands. The irrigated area as a whole is highly developed and well colonized, but is seriously handicapped by lack of an adequate water supply, except where water is obtained by pumping at high cost. Where a full water supply is available, crop returns are higher than on most irrigation projects, and it is concluded that the project is feasible if constructed with interest-free funds.

The upper-valley development contemplates the construction of a rock-fill dam with concrete-slab face at the Magpie site on South Fork of Ogden River to form a reservoir with 14,000 acre-feet of capacity at an estimated cost of \$1,907,000. It would provide 8,000 acre-feet of storage for Ogden City and furnish a supplemental supply to 6,000 acres of irrigated lands in the upper Ogden Valley. Assuming that the lands irrigated would pay only for the additional cost of

obtaining 14,000 acre-feet of capacity instead of 8,000 acre-feet at this site, the cost to irrigation interest under this project would be \$322,000, which amount could be repaid by the lands benefited.

Utah Lake investigations.—These investigations are being conducted to determine the feasibility of increasing the water yield of Utah Lake by diking off Provo Bay and Goshen Bay and conserving water lost by evaporation from these areas. During August and September 1932 field tests were made along the line of the proposed Goshen Bay dike to determine the character of foundation and construction materials. Twenty-three borings were made at intervals of 1,000 to 1,300 feet across Utah Lake and 2 borings were made several miles south of the dike line and 1 boring near the middle of Utah Lake. The material was found to be a fine clay. Eight bearing tests were made of the material in place. Data were assembled on past dredging operations at the north end of Utah Lake and on dikes constructed in Great Salt Lake with similar foundation conditions.

Sanpete division.—Investigations were continued on plans for transmountain diversions of Colorado River Basin waters for lands in Sanpete County, with particular attention to the present and future water requirements of lands along Cottonwood Creek, Huntington Creek, and Price River.

Field tests were made to determine the character and extent of embankment material for the proposed Gooseberry Dam. Designs and estimates were prepared for various heights of dam at the Gooseberry site to aid in selecting a project plan for the Gooseberry unit.

Ouray Valley project.—A reconnaissance was made of the Ouray Valley project to determine the general feasibility of a plan for diverting waters from Duchesne River to lands which are now partially irrigated by means of a long canal diverting from the Uintah River. Inadequate stream flow records preclude an immediate conclusive report on project possibilities.

WASHINGTON

Columbia Basin project investigations.—Preliminary studies were made in the Denver office to determine the feasibility of a 2-stage development, contemplating the construction of a low dam and power plant at the Grand Coulee site, with a view of later enlargement, when conditions warrant, to that ultimately required for the complete Columbia Basin project development.

A report dated May 24, 1933, presented an estimate of \$59,235,000 for a dam of the multiple-arch type producing a head of 150 feet and a power plant of 8 units with an electrical capacity of 65,000 kilowatts, together with transformer and switching equipment. The general design for this development was arranged to permit the dam to be

raised to the ultimate head of 353 feet without interfering with power production. Financial studies of this development based on an interest rate of 4 percent indicate that such a step development is at least as desirable as the plan for initial construction to the ultimate height, interest savings offsetting increased construction investment occasioned by increased quantities and an interrupted construction program. With long delays in ultimate development, net investment is materially reduced through intervening repayment of initial construction costs.

Roza Division—Yakima project.—A report dated September 1932, presents a plan and estimate for this division and was prepared after a full review of alternative plans for the production of power needed for pumping water to almost one half of the total area of the division, including one of a power canal through Moxee Valley solely for power production, this plan being discarded in favor of enlargement of the main canal of the division to the lower end of the tunnel piercing the Yakima Ridge. The main canal with a total length of 99 miles will have an initial capacity of 2,165 second-feet of which 1,200 second-feet would be for irrigation purposes and 965 second-feet for power purposes, power water being carried for a distance of 12 miles where it would be returned to the Yakima River at Yakima with a power head of 140 feet.

The principal construction features of the canal are the diversion dam, a low concrete dam surmounted by drum gates, a tunnel 9,700 feet long through Yakima Ridge between East Selah and Moxee Valleys, and a tunnel 5,000 feet long through Rattlesnake Ridge near Union Gap.

The division comprises 72,000 acres of irrigable land, of which nearly 10,000 acres lie in Selah and Moxee Valleys near Yakima, with the remainder lying in a strip averaging $2\frac{1}{2}$ miles wide along the north valley slope from Wapato to Benton City, a distance of 50 miles. The lands are located well above the river bottoms, generally of superior soil and topography requiring little artificial drainage and adapted to the growing of fruit and general crops. They were classified as to irrigability in 1927. The construction cost is estimated at \$18,161,000, of which \$934,000 would be allocated to commercial power, leaving a net irrigation cost of \$239 per acre, including power production and pumping facilities. The estimates reflect construction conditions as of 1930 and under conditions prevailing in the past fiscal year the cost would be somewhat less. Expenditures have already been made to the extent of \$2,800,000, principally for storage, the needs of this division being taken care of along with other divisions of the Yakima project in the construction of the completed reservoirs.

WYOMING

North Platte River power investigations.—Preliminary designs and estimates were prepared for a dam and power plant at the Kortes site on North Platte River. A geological map was prepared of the Northgate dam site and preliminary water-supply studies were made to determine the operation and utilization of the Northgate reservoir site. A profile was prepared of the North Platte River from the head of the Northgate reservoir site in Colorado to Casper, Wyo.

Further progress on these investigations has been delayed, pending the outcome of negotiations between the States of Colorado, Wyoming, and Nebraska on the division of waters from the North Platte River. Proposals by Colorado interests to divert a part of North Platte River flows to Cache la Poudre River in the vicinity of Cameron Pass, will, if carried out, materially affect the plans for power development in Wyoming.

COLORADO RIVER BASIN INVESTIGATIONS UNDER SECTION 15 OF BOULDER CANYON PROJECT ACT

Work was continued along the general lines followed in the previous fiscal year, in the main being directed to an inventory of irrigation resources, with an average working force of 35.

Arizona.—Topography and other appurtenant data were secured on a canal line from the Parker Dam site to the Gila River Valley for a study of the relative feasibility of irrigating the Gila Valley by diversion at Parker and by pumping from the proposed Imperial Dam which will be constructed to deliver water to the All-American Canal. It is expected that the final results will show the pumping plan to be preferable. A land classification was made of the Colorado River Indian Reservation (Parker Valley) under difficult conditions because of heavy brush and the lack of passable roads or trails.

Colorado.—In the latter part of the year a survey party was engaged upon investigation of possible reservoir sites, and particularly sites which had not been covered by private surveys on the Little Snake River and its tributaries in the Yampa River drainage area. Consideration is also being given to feasible canal routes to serve the lands on the divide between Little Snake and Yampa Rivers.

Nevada.—Field surveys were completed on possibilities of irrigating with waters from the Boulder Canyon Reservoir of lands lying adjacent thereto within practicable pumping lifts, including classification of such lands.

New Mexico.—Land-classification surveys were initiated in 1932 and continued throughout the fiscal year on lands lying to the south of the San Juan River and principally within the Navajo Indian

Reservation to determine the areas that might be irrigated by diversions from the San Juan River. Some consideration was also being given to the possibilities of diverting waters of the tributaries of San Juan River to the Rio Grande drainage area, such plan if carried out to be largely in lieu of irrigation of lands in New Mexico with San Juan River waters.

Utah.—Surveys were completed of possible reservoir sites to utilize the surplus waters of the Paria and Virgin Rivers and of Kanab Creek in southern Utah, and land classifications were made of irrigable areas reclaimable with such waters and particularly areas to be served with Virgin River waters in the vicinity of St. George, Utah, and Littlefield, Ariz. In connection with investigations of transmountain diversions from tributaries of the Price and San Rafael Rivers to the drainage area of the San Pitch River, investigations were made of the irrigability of lands that could be served by these tributaries of the Colorado River in the vicinity of Price and Castle Gate, Utah.

Wyoming.—Classification of the irrigable area in the Green River Basin of Wyoming was continued through the year except as such work was suspended during the winter. Investigations were also conducted on reservoir sites to conserve flood and winter flows now escaping in the Green and Blacks Fork Rivers. Test pits were dug at the dam site for a reservoir on Green River immediately below Kendall, Wyo.

TABLES

RECLAMATION TABLE 1.—Consolidated financial statement, June 30, 1933

DEBIT SIDE	
Construction account:	
Primary projects:	
Cost of irrigation works:	
Original construction.....	\$202,180,218.35
Supplemental construction.....	12,547,586.70
Value of works taken over.....	2,056,939.90
Total construction cost.....	\$216,784,744.95
Operation and maintenance prior to public notice (net).....	2,788,382.94
Operation and maintenance deficits and arrearages funded with construction.....	5,134,986.93
Penalties on water-right charges funded with construction.....	1,422,862.17
	<u>9,346,232.04</u>
	<u>226,130,976.99</u>
Less (income items):	
Construction revenues.....	6,468,235.89
Contributed funds.....	1,733,552.76
Nonreimbursable appropriation (Rio Grande Dam).....	1,000,000.00
	<u>9,201,788.65</u>
	<u>216,929,188.34</u>
Less:	
Abandoned works, nonreimbursable cost, and charge-offs.....	15,613,098.50
Balance payable.....	<u>\$201,316,089.84</u>
Yuma auxiliary project:	
Cost of irrigation works.....	899,837.00
Impounded funds, economy acts.....	241.57
	<u>900,078.57</u>
Less: Construction revenues.....	1,605.47
	<u>898,473.10</u>
Palo Verde Valley flood protection:	
Cost of reconstruction and repairs.....	<u>30,017.34</u>
Secondary projects and general investigations:	
Cost of surveys and investigations.....	2,913,257.54
Less: Contributed funds.....	544,323.14
	<u>2,368,934.40</u>
General offices' expense undistributed.....	1,6,396.30
Plant and equipment.....	503,072.57
Materials and supplies.....	304,510.08
Accounts receivable:	
Current accounts due.....	1,834,894.14
Deferred accounts not due.....	153,998,392.17
	<u>155,833,286.31</u>
Undistributed clearing cost accounts.....	<u>17,786.36</u>
Unadjusted debits: Disbursement vouchers in transit.....	<u>1,586.71</u>
Cash:	
Balance on hand:	
Reclamation fund.....	2,775,970.40
Yuma auxiliary fund.....	155,657.79
Special funds.....	116,558.61
	<u>3,048,186.80</u>
In special deposit and in transit.....	18,600.86
	<u>3,066,787.66</u>
Total debits.....	<u>364,298,575.35</u>
CREDIT SIDE	
Security for repayment of cost of irrigation works:	
Contracted construction repayments.....	\$197,475,636.77
Yuma auxiliary contracted repayments.....	605,679.08
	<u>\$198,081,315.85</u>
Current accounts payable.....	438,254.32
Deferred and contingent obligations.....	831,204.78
Reserves and undistributed profits.....	7,139,482.86
Operation and maintenance results, surplus.....	708,109.72
Unadjusted credits: Collection vouchers in transit.....	621.11

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1933—Continued*

Government aid for reclamation of arid lands:	
Reclamation fund	\$155,898,434.83
Special funds:	
Increase of compensation	2,797,960.33
Rio Grande Dam	1,000,000.00
Wind River Indian (Riverton)	359,176.04
Judgments, United States courts	602,814.38
Drainage and cut-over lands	99,815.08
General investigations, 1923-Dec. 31, 1924	266,352.66
Arid, semiarid, swamp, and cut-over timberlands	35,923.75
Columbia Basin irrigation project	11,634.28
Colorado River levee system	447,321.01
Palo Verde Valley flood protection	49,599.09
	161,569,031.45
Advances to reclamation fund:	
Treasury loan (act of June 25, 1910)	\$20,000,000.00
Less: Amount repaid	10,000,000.00
	10,000,000.00
Treasury loan (act of Mar. 4, 1931)	5,000,000.00
	15,000,000.00
Less: Nonreimbursable appropriation, Rio Grande Dam	176,569,031.45
	1,000,000.00
	175,569,031.45
Less: Impairment of funds:	
Abandoned works	1,348,044.64
Nonreimbursable construction cost	721,636.25
Operation and maintenance cost uncollectible	453,272.39
Charge-offs, act of May 25, 1926	14,639,947.96
Washington office cost since Dec. 5, 1924	1,196,546.52
Attendance at meetings, cost	1,815.90
Giving information to settlers	1,900.70
Prepaid Civil Service retirement fund	2,340.33
	18,365,504.69
Less: Impounded funds, economy acts, reclamation fund	157,203,526.76
	103,940.05
	\$157,099,586.71
Total credits	364,298,575.35

¹ Contra.RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1933*

Items	Funds			
	Reclamation	Yuma auxiliary	Colorado River levee system	Palo Verde flood protection
Balance on hand, July 1, 1932	\$3,706,363.62	\$159,517.63	\$118,745.08	
Receipts:				
Proceeds from sale of public lands	293,863.78			
Proceeds from oil leasing act	1,833,721.00			
Proceeds from potassium royalties	8,692.03			
Proceeds from Federal power licenses	102,811.82			
From project collections	2,449,166.94	15,112.55		\$212.94
From general treasury			50,000.00	50,000.00
Total	8,394,619.19	174,530.18	168,745.08	50,212.94
Expenditures:				
Disbursements	5,504,708.74	18,630.82	55,681.99	43,637.52
Impounded funds, act of June 30, 1932	103,940.05	241.57	2,678.99	400.91
Total	5,618,648.79	18,872.39	58,360.98	44,038.43
Balance on hand June 30, 1933	2,775,970.40	155,657.79	110,384.10	6,174.51

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Potas-sium roy-alties and rentals ¹	Total to June 30, 1933
	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933		
Alabama.....			\$92,852.85	\$164,545.01		\$164,545.01
Arizona.....	\$36,395.24	\$2,614,351.21	106.68	159.86		2,614,511.07
California.....	40,555.21	8,080,237.01	790,715.61	9,455,013.88	\$99,966.37	17,635,217.26
Colorado.....	24,773.34	10,208,245.15	28,796.60	430,868.49		10,639,113.64
Idaho.....	6,095.71	6,970,930.71	449.47	12,266.64		6,983,197.35
Kansas.....		1,032,764.48				1,032,764.48
Louisiana.....			2,955.41	27,571.16		27,571.16
Montana.....	27,555.12	15,251,462.91	32,073.28	1,027,479.58		16,278,942.49
Nebraska.....	19.02	2,095,386.57				2,095,386.57
Nevada.....	7,772.09	1,023,146.53	126.00	4,859.37		1,028,005.90
New Mexico.....	60,978.46	6,492,991.96	72,342.30	335,931.97		6,828,923.93
North Dakota.....	2,638.71	12,216,644.76	19,156.75	108,398.05		12,325,042.81
Oklahoma.....	507.12	5,927,178.02				5,927,178.02
Oregon.....	13,035.12	11,940,230.62		10.25		11,940,240.87
South Dakota.....	354.19	7,724,475.80	261.69	1,147.55		7,725,623.35
Utah.....	23,443.28	4,198,395.26	44,989.92	354,774.28		4,553,169.54
Washington.....	2,485.85	7,436,697.15	5,677.97	28,011.88		7,464,709.03
Wyoming.....	52,442.74	8,468,998.63	743,216.47	31,696,758.46		40,165,757.09
Total.....	293,863.78	111,682,136.77	1,833,721.00	43,647,796.43	99,966.37	155,429,899.57
Proceeds, Federal water power licenses.....						3,468,535.26
Grand total.....						155,898,434.83

¹ Proceeds for fiscal year, \$8,692.03.² Contra.³ Proceeds for fiscal year, \$102,811.82.

RECLAMATION TABLE 4.—*Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts to be repaid by water users*

State and project	Construction cost Fiscal year 1933	Operation and main- tenance before pub- lic notice (net)		Construction revenues, contributed funds, and nonreimbursa- ble costs and appropriation (contra)		Abandoned works, non- reimbursa- ble cost, and authorized charge-offs ¹	Total to be repaid by water users
		To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933		
Arizona: Salt River Arizona-California: Yuma Colorado: Orlando	\$12,744,222.59 \$2,117,88 9,376,730.71 2,389,302.93	\$115,993.50 2 \$227,28 373,528.37 2 11,432.99	\$115,993.50 2 \$227,28 373,528.37 2 11,432.99	\$31,886.52 \$2,669.91 709.71 204.00	\$31,886.52 \$2,669.91 709.71 204.00	\$312,066.81 225,842.11 28,403.88	\$10,166,321.97 9,556,383.49 2,360,175.77
Grand Valley Uncompahgre Idaho: Boise King Hill Minidoka Minidoka-Qooding Montana: Garden City	154,365.13 5,015,342.42 6,422,627.88 7,790,04 1,905,918.30 15,017,209.32 4,122,957.92 342,963.68	188,621.28 311,103.02 422,283.48 377,653 320,543.15 230,36 52,368.10	188,621.28 311,103.02 422,283.48 377,653 320,543.15 230,36 52,368.10	102,500.00 186,197.53 879,515.76 33,831.48 110,122.51 506,729.06 46,227.94 56,414.17	102,500.00 186,197.53 879,515.76 33,831.48 110,122.51 506,729.06 46,227.94 56,414.17	268,692.83 812,374.64 22,385.72 455,676.11 28,187.27 2,065,754.93 2,172.58 61,356.82	\$24,714.87 505.71 1,260,791.36 51,865.13 2,163,039.60 5,634,897.78
Bitter Root Hunley Milk River Sun River Montana-North Dakota: Lower Yellow- stone Nebraska-Wyoming: North Platte Nevada: Newlands New Mexico: Carlsbad Hondo New Mexico-Texas: Rio Grande North Dakota: Buford-Trenton Williston Oregon: Baker Umatilla Vale Oregon-California: Klamath Oregon-Idaho: Owyhee Oregon-Dakota: Palouse	80,000.00 1,562,922.99 6,844,118.15 437,255.58 133,133.75 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 1,464,649.87 339,491.68 15,076,073.39 223,423.06 517,630.09 1,101,67 5,137,937.20 3,479,380.62 6,227,451.61 1,576.98 2,297,857.81 3,17,751.77 32,452.01 2,31,75 2 165.00 281,591.04 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 222,98 1,950.00	2,100,000.00 3,393.13 100,393.62 102,91.34 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 3,393.13 1,101,67 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 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1,109.62 387,974.62 100,393.62 102,91.34 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 3,393.13 1,101,67 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 387,974.62 100,393.62 102,91.34 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 3,393.13 1,101,67 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 387,974.62 100,393.62 102,91.34 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 3,393.13 1,101,67 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 387,974.62 100,393.62 102,91.34 414.18 2,363.78 3,758.80 733,294.42 72,506.44 2,44.51 3,393.13 1,101,67 5,137,937.20 8,574.07 81,576.54 490.67 30,397.21 1,237,640.06 11,090.62 1,109.62 387,974.62 100,393.62 102,91.34 414.18 2,363.78 3,758.80 7				

RECLAMATION TABLE 4.—*Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts to be repaid by water users—Continued*

1 Abandoned works:

RECLAMATION TABLE 5.—Consolidated statement, by projects, of operation and maintenance cost operation and maintenance returns, and other credits, and results, calendar year 1932

State and project	Cost	Operation and maintenance returns			Other credits ¹	Results: Excess (+) or deficit (-)
		Charges contracted	Penalties	Discounts (contra)		
Arizona: Yuma auxiliary	\$20,246.35	\$25,737.60			\$1,103.70	+86,554.95
Arizona-California: Yuma	194,703.26	228,726.25	\$389.40	\$311.06	10,275.24	+44,376.67
California: Orlando	35,164.51	38,928.78	576.62	65.21	280.15	+4,555.83
Colorado:						
Grand Valley	31,803.14	33,750.00			688.00	+2,634.86
Uncompahgre	1,366.29	1,188,762.22	4,302.64		42.32	-21,844.29
Idaho:						
Boise	8,161.44	9,570.82				+1,409.38
Minidoka-Gooding	70,174.84	61,951.19				-1,816.32
Montana:	44,533.44				12,532.06	-21,862.15
Huntley		2,3,018.11				
Sun River	9,960.58	48,164.41				
Montana-North Dakota: Lower Yellowstone	2,400.00	2,509.39				
Nebraska-Wyoming: North Platte	671.66	982.04				
Nevada: Newlands	21,573.55	19,700.54	2,46.14			
New Mexico: Carlsbad	2,14,214.15	2,14,214.15				
New Mexico-Texas: Rio Grande	40,237.52					
Oregon: Umatilla	281,841.91	267,625.37	9,689.32			
Oregon-California: Klamath	3,111.86	2,588.93	2.13			
South Dakota: Belle Fourche	95,896.66	2,3,466.92				
Washington:	66,687.08	63,700.00				
Yakima	218,366.55	250,522.41	6,160.24	1,909.42		+42,462.38
Yakima-Kittitas	76,487.19	79,083.82	3 .27			-578.05
Wyoming:						
Riverton	19,564.51					
Shoshone	2,669.02	2,390.02				
Total	1,275,761.36	926,530.17	16,545.45	2,593.86	95,261.92	275,384.28

¹ Contra.

¹ Amounts to be repaid with construction and charge-offs under act of May 25, 1926 (44 Stat., 636)

RECLAMATION TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results to Dec. 31, 1932

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) or deficit (-)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid by construction	
Arizona: Yuma auxiliary	\$352,382.46	\$420,422.64	\$9,337.74	\$1,106.79	\$9,430.19			+\$76,901.32
Arizona-California: Yuma	4,874,197.48	4,866,616.48	99	59,133.26	207,358.26			+243,371.19
California: Orland	530,719.30	565,252.27	2,780.61	21,736.09	3,711.73			+19,289.22
Colorado: Grand Valley	224,283.21	240,500.00	1,009,582.18	10,934.23	11,602.77	3,450.00		+19,666.79
Colorado: Uncompahgre	1,191,521.60					24,503.88		+10,440.46
Idaho: Boise	2,822,903.56	2,134,398.59	69	769.20	52,649.72	111,044.96		+40,729.84
Idaho: King Hill	2,136,734.25	1,519.60	27	1,519.89	342,89	97,199.14		+5,373.37
Idaho: Minidoka-Gooding	2,333,258.10	1,928,190.51	20	2,463.35	126,821.93	266,497.42		-42,406.99
Idaho: Minidoka-Gooding	67,283.16	1,844.43			12,891.51	10,140.23		
Montana: Huntley	1,014,941.03	554,787.34	15	712.18	10,449.84	11,586.91	361,950.44	
Montana: Milk River	321,232.88	260,605.12	164,100.32	6,360.24	1,662.25	5,652.71	308,62	+37,756.32
Montana: Sun River	321,676.88	295.30	3,488.33	2,559	1,348.00	29,626.27	90,612.24	-268.14
Montana-North Dakota: Lower Yellowstone	1,349,676.18	2,849,295.57	1,859,663.76	27,257.89	35,811.80	135,751.13	865,631.52	+105,504.20
Montana-North Dakota: North Platte	2,825,470.91	1,174,581.57	28	600.62	24,910.08	26,012.61	1,043,899.25	-9,823.22
Nevada: Newlands	1,453,400.54	874,468.99	30,12.69	17,449.07	27,639.88	1,211,292.00	28,080.60	-35,933.24
New Mexico: Carlsbad	952,829.73	3,650,340.14	20,408.97	4,486.44	69,94.86		1,934.00	
New Mexico-Texas: Rio Grande	3,736,167.53							
North Dakota: Bismarck-Trenton	74,781.07	2,317.41				10.00	2,72,453.66	
North Dakota: Williston	904,662.04	34,042.75		45.81		489,754.75	2,380,818.73	
Oregon: Umatilla	698,042.52	379,147.64	7,697.84	3,314.38	30,870.63	1,91,063.35	197,132.52	+13,575.08
Oregon-California: Klamath	1,380,414.07	1,172,203.92	3,623.28	4,942.27	200,559.77		65,166.38	+56,197.11
South Dakota: Belle Fourche	1,679,976.32	948,508.18	20,196.35	9,240.72	31,919.80		570,194.90	+10,209.19
Utah: Strawberry Valley	437,856.39	376,880.88	10,196.17	11,858.67	20,400.30		42,237.71	
Washington: Yakima	649,647.22	371,441.72	1,451.15	397.47	70,485.39	1,181,472.06	25,194.37	+87,918.42
Washington: Yakima-Kittitas	4,865,716.54	4,697,556.66	97,521.65	59,365.15	143,199.05		74,822.75	+2,566.36
Wyoming: Riverton	157,269.93	163,040.63					6,795.66	
Wyoming: Shoshone	87,352.14	546,235.71	13,614.85	11,051.05	11,978.65		75,373.49	+80,720.40
Total	36,379,10.20	28,785,636.68	505,375.18	368,591.53	1,901,365.64	1,210,263.80	5,006,928.69	+721,878.26

^a Projects abandoned.^b Charge offs under act of May 25, 1926 (44 Stat. 636).

RECLAMATION TABLE 7.—*Accounts receivable, construction water-right charges
(including contributed funds)*

State and project	Due		Collected		Uncollected June 30, 1933	
	Fiscal year 1933	To June 30, 1933	Cash			
			Fiscal year 1933	To June 30, 1933		
Arizona:						
Salt River	\$152,490.32	\$7,268,705.72	\$7,116,215.41		\$152,490.32	
Yuma auxiliary	3,183.53	594,941.50	588,866.51		4,490.94	
Arizona-California: Yuma	43,780.94	3,912,486.55	74,230.97	3,421,372.34	13,491.87	
California: Orland	19,935.83	824,128.75	19,588.90	782,897.71	41,231.04	
Colorado:						
Grand Valley	67,938.05	356,868.50	87,500.00	290,229.94	66,638.56	
Uncompahgre	90,180.95	580,397.16	103.44	427,247.72	62,865.05	
Idaho:						
Boise	123,418.46	4,018,105.88	24,261.64	3,990,635.67	27,193.29	
King Hill	16,000.00	82,825.66		8,025.66	74,800.00	
Minidoka	85,889.28	8,360,028.04	37,491.92	7,740,749.38	547,565.83	
Minidoka-Gooding			280,798.48		71,712.83	
Montana:						
Huntley	6,450.01	557,681.67	5,062.66	467,005.12	90,538.16	
Milk River	42,437.84	49,332.76		3,002.76	46,330.00	
Sun River	3,705.76	207,952.54	3,550.98	204,493.59	3,045.55	
Montana-North Dakota: Lower Yellowstone	510.36	283,862.89	510.36	288,862.89		
Nebraska-Wyoming: North						
Platte	351,070.76	3,704,030.71	34,846.84	2,793,843.75	854,177.36	
Nevada: Newlands	14,907.71	1,147,305.36	14,972.84	1,086,990.76	55,965.98	
New Mexico: Carlsbad	104,913.04	891,349.52	3,865.06	891,070.65	81.25	
New Mexico-Texas: Rio Grande	42,138.87	3,536,896.20	10,000.00	3,151,777.81	311,671.64	
Oregon:						
Baker		5,000.00		5,000.00		
Umatilla	22,128.51	538,515.79	625.13	398,191.14	5,190.89	
Vale		5,000.00		5,000.00		
Oregon-California: Klamath	21,183.44	1,117,704.21	37,316.58	1,111,540.43	4,538.94	
Oregon-Idaho: Owyhee		4,354.61		4,354.61		
South Dakota: Belle Fourche	7,667.49	630,051.20	6,500.00	552,575.54	77,475.66	
Utah:						
Salt Lake Basin		44,756.77		44,756.77		
Strawberry Valley	16,344.67	1,313,961.47	49,719.35	1,298,990.08	9,165.00	
Washington:						
Okanogan	10,425.94	162,060.27	425.94	133,798.04	28,271.23	
Yakima	101,439.03	6,908,418.67	33,349.08	6,586,209.68	36,363.75	
Yakima-Kittitas		1,000.00		1,000.00	285,845.24	
Wyoming: Shoshone	14,814.51	827,491.91	14,229.63	820,802.90	6,490.18	
Total	731,224.22	48,221,030.80	432,717.91	44,496,305.34	1,089,466.08	
Paid in advance of due dates			27,163.43	412,403.79	3,344.49	
Refunds				98,591.20	3,212.84	
Total collections			459,881.34	45,007,300.33		

¹ Contra.² Other credits for fiscal year, \$481,723.62.³ Decrease for fiscal year, \$53,663.18.

RECLAMATION TABLE 8.—*Accounts receivable, operation and maintenance charges (after public notice)*

State and project	Due		Collected		Uncollected June 30, 1933	
	Fiscal year 1933	To June 30, 1933	Cash			
			Fiscal year 1933	To June 30, 1933		
Arizona: Yuma auxiliary	\$18,426.28	\$435,149.08	\$15,903.58	\$409,140.60	\$13,359.25	
Airzona-California: Yuma	130,166.05	3,570,951.22	126,385.76	3,375,370.68	176,550.38	
California: Orland	38,682.38	565,003.77	30,159.82	510,544.96	22,416.03	
Colorado:						
Grand Valley	24,115.14	264,615.14	28,630.03	258,130.03	6,485.11	
Uncompahgre	1 10,398.49	1,008,683.69	1 10,398.49	977,809.79	30,873.90	
Idaho:						
Boise	8,832.86	2,148,942.91	14,210.42	2,095,959.29	52,649.72	
King Hill		60,711.27		59,192.22	1,519.05	
Minidoka	47,003.19	1,975,111.22	29,051.03	1,866,467.93	108,025.26	
Minidoka-Gooding	3,013.12	4,857.55	3,013.12	4,857.55		
Montana:						
Huntley		554,787.34		543,594.31	11,193.03	
Milk River	41,581.48	261,204.11	35,038.98	236,183.49	1,662.25	
Sun River	2,359.39	166,500.32	2,092.57	161,966.28	4,352.22	
Montana-North Dakota: Lower Yellowstone	429.71	339,952.99	429.71	339,948.36	4.63	
Nebraska - Wyoming: North Platte	14,737.43	1,875,380.40	11,831.35	1,803,909.44	62,087.90	
Nevada: Newlands		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad	1 85.68	874,383.31	74,448.04	857,381.00	16,872.71	
New Mexico-Texas: Rio Grande	249,084.35	3,537,970.82	290,015.45	3,226,254.22	218,416.54	
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon: Umatilla	2,726.74	379,285.45	4,410.78	370,551.55	7,253.96	
Oregon-California: Klamath	55,350.92	1,192,161.96	55,755.88	1,157,914.97	30,536.22	
South Dakota: Belle Fourche	56,767.01	1,005,275.19	56,767.01	995,899.20	9,375.99	
Utah: Strawberry Valley		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan		371,441.72		368,788.67	2,653.05	
Yakima	218,915.05	4,762,641.06	201,899.71	4,483,935.72	61,233.02	
Yakima-Kittitas	118,212.02	212,415.63	82,557.02	176,790.63		
Wyoming: Shoshone	2,566.02	548,801.73	2,556.24	524,050.93	23,705.43	
Total	1,022,484.97	27,704,050.49	1,054,788.01	26,341,925.74	2 905,279.23	
Paid in advance of due dates			1 17,344.54	18,037.48	16.53	
Penalties and interest			10,541.76	489,104.96	20,480.00	
Refunds			10,869.68	36,550.16	156.09	
Total collections			1,058,854.91	26,885,618.34		

¹ Contra.² Other credits for fiscal year, \$92,453.88.

RECLAMATION TABLE 9.—*Accounts receivable, rental of irrigation water*

State and project	Due		Collected		Other credits to June 30, 1933	Uncollected, June 30, 1933		
	Fiscal year 1933	To June 30, 1933	Cash					
			Fiscal year 1933	To June 30, 1933				
Arizona:								
Salt River.....	\$2,246,726.01		\$2,246,726.01					
Yuma auxiliary.....	\$833.70	10,205.19	\$626.70	9,998.19		\$207.00		
Arizona-California: Yuma.....	7,083.68	526,156.66	7,122.93	512,308.00	\$12,654.19	1,194.47		
California: Orland.....		121,437.30		121,437.30				
Colorado:								
Grand Valley.....	10,897.60	490,119.08	8,646.38	480,467.19	6,500.67	3,151.22		
Uncompahgre.....	1,968.77	1,221,188.08	405.16	1,218,087.51		3,100.57		
Idaho:								
Boise.....	8,050.00	781,888.57	8,050.00	777,168.07	4,720.50			
Minidoka.....	26,199.84	556,440.79	36,674.84	553,064.28	3,351.51	25.00		
Minidoka-Gooding.....	13,796.00	13,796.00	4,935.33	4,935.33		8,860.67		
Montana:								
Huntley.....	454.41	10,706.42	454.41	10,706.42				
Milk River.....	1,441.52	237,319.57	672.83	226,972.79	1,208.14	9,138.64		
Sun River.....	82.47	132,187.56	295.00	129,388.16	1,366.62	1,432.78		
Montana-North Dakota: Lower Yellowstone.....	363.78	135,051.08	354.60	135,041.90		9.18		
Nebraska-Wyoming: North Platte.....	1,612.75	341,528.79	1,612.75	341,509.79	10.00	9.00		
Nevada: Newlands.....		28,291.16		22,114.31	6,176.85			
New Mexico:								
Carlsbad.....	348.99	39,424.83	380.85	39,407.58		17.25		
Hondo.....		9,129.70		9,129.70				
New Mexico-Texas: Rio Grande.....	13,813.60	1,452,601.01	15,356.30	1,434,929.51		17,671.50		
North Dakota:								
Buford-Trenton.....		31.75		31.75				
Williston.....		2,117.28		2,117.28				
Oregon:								
Umatilla.....	1,774.00	94,902.82	1,774.00	68,626.02		26,276.80		
Vale.....	9,488.75	21,037.17	6,084.89	16,107.21		4,929.96		
Oregon-California: Klamath.....	29,201.43	270,528.59	26,302.90	264,234.23	25.00	6,269.36		
South Dakota: Belle Fourche.....	349.66	9,054.48	349.66	9,036.68	17.80			
Utah: Strawberry Valley.....		17,596.13		17,596.13				
Washington:								
Okanogan.....		110,645.28		108,061.09	2,584.19			
Yakima.....	2,167.78	178,757.53	1,885.93	168,832.23		9,925.30		
Wyoming:								
Riverton.....	4,792.56	16,293.49	4,285.91	13,739.42	2,544.32	9.75		
Shoshone.....	5,750.83	69,189.60	5,716.41	68,062.83	275.09	851.68		
Total.....	110,961.88	9,144,351.92	131,987.78	9,009,836.91	\$41,434.88	93,080.13		

¹ Contra.² Other credits for fiscal year, \$642.72

RECLAMATION TABLE 10.—*Irrigation and crop results on Government reclamation projects, 1932* i

State and project	Lands on projects covered by crop census				Crop value		Crop value	
	Irrigable acreage ²	Irrigated acreage	Cropped acreage	Total	Per acre	Total	Per acre	
Arizona: Salt River Arizona-California: Yuma ³	245,658	242,110	224,444	\$9,660,555	\$43.04	39,500	\$775,000	\$19.65
49,055	47,042	44,204	1,402,615	31.73	200	186	20,338	117.28
49,278	38,663	36,250	1,023,078	30.43	.....	.....	.....	.....
7,765	2,991	2,946	1,431,088	14.64	.....	.....	.....	.....
6,026	4,188	3,995	84,649	21.19	.....	.....	.....	.....
1,986	1,236	1,014	171,780	169.36	200	186	20,338	117.28
20,704	14,059	13,017	318,064	24.43	.....	.....	.....	.....
Colorado:								
Grand Valley.....	30,384	15,660	14,973	243,611	16.26	18,400	13,500	228,200
Uncompahgre.....	75,654	59,700	59,666	706,272	11.84	1,650	1,550	18,540
Idaho:								12.00
Boise.....	172,303	156,341	148,069	1,614,182	10.86	143,950	133,048	1,355,400
New York Irrigation District.....	17,612	15,762	15,244	125,497	8.23	.....	.....	10.50
Nampa-Meridian Irrigation District.....	39,943	36,774	35,653	398,087	11.17	.....	.....	.....
Boise-Kuna Irrigation District.....	48,351	45,116	45,556	43,532	9.98	.....	.....	.....
Wilder Irrigation District.....	57,740	50,816	46,613	572,230	12.28	.....	.....	.....
Big Bend Irrigation District.....	1,733	1,417	1,327	14,193	10.70	.....	.....	.....
Black Canyon Irrigation District.....	6,874	6,457	6,276	69,643	11.10	.....	.....	.....
King Hill.....	8,000	7,042	6,834	69,070	10.10	.....	.....	.....
Minidoka.....	120,941	107,583	99,913	1,444,575	14.46	727,951	645,271	621,702
Minidoka Irrigation District.....	72,022	62,350	57,552	793,575	13.79	.....	.....	11.80
Burley Irrigation District.....	48,919	45,233	42,361	651,000	15.37	.....	.....	.....
Montana:								
Bitter Root Irrigation District ³	18,240	15,825	15,023	206,486	13.74	.....	.....	.....
Huntley.....	32,540	23,880	23,880	502,825	21.08	.....	.....	.....
Malta division.....	134,557	46,234	46,020	588,972	12.80	.....	.....	.....
Glasgow division.....	56,632	16,915	210,874	12.58	.....	.....	.....	.....
Chinook division.....	22,133	5,639	5,579	33,688	6.04	.....	.....	.....
Sun River.....	55,772	23,680	23,680	344,400	14.54	.....	.....	.....
Fort Shaw division.....	55,084	36,054	34,126	202,688	5.18	.....	.....	.....
Greenfields and Big Coulee divisions.....	9,370	7,321	4,741	57,433	7.75	.....	.....	.....
Montana-North Dakota:								
Lower Yellowstone.....	45,801	31,235	31,235	669,455	21.43	.....	.....	.....
District No. 1.....	32,307	21,781	21,781	475,112	20.81	.....	.....	.....
District No. 2.....	14,584	9,454	9,454	194,343	20.56	.....	.....	.....

Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts

RECLAMATION TABLE 10.—*Irrigation and crop results on Government reclamation projects, 1932—Continued*

State and project	Lands on projects covered by crop census				Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts			
	Irrigable acreage ¹	Irrigated acreage	Cropped acreage	Crop value	Irrigable acreage	Cropped acreage	Crop value	
	Total	Per acre	Total	Per acre	Total	Per acre	Total	Per acre
Nebraska-Wyoming:								
North Platte.....	234,956	188,516	185,998	2,969,359	15,96	126,355	93,249	105,108
Pathfinder Irrigation District.....	112,368	88,642	87,985	1,143,133	12.99	22,02	1,080,669	1,765,061
Gering and Fort Laramie Irrigation District.....	54,876	51,383	49,524	1,080,669	22.02	17.84	625,075	16.79
51,632	35,034	35,034	13,455	110,482	8.21	510,168	510,168	10.25
16,170	13,455	13,455	49,730	22,515	19.59	441,017	441,017	19.59
Northport Irrigation District.....	87,500	51,927	51,927	24,761	22,515	19.59	510,168	510,168
New Mexico: Newlands.....	25,055	24,761	24,761	137,449	134,531	3,539,326	26,30	26,30
New Mexico: Carlsbad.....	88,000	79,302	77,618	1,986,682	25.60	77,000	42,932	42,932
New Mexico: Texas.....	88,000	79,302	77,618	1,986,682	25.60	77,000	42,932	42,932
Rio Grande.....	16,000	12,443	12,322	205,361	16.67	12,322	12,322	12,322
Elephant Butte Irrigation District.....	72,000	66,839	65,939	1,751,321	27.28	27,28	27,28	27.28
Rio Grande Valley.....	67,000	58,147	58,147	56,913	1,552,644	27.28	56,913	56,913
El Paso County Water Improvement District No. 1.....	56,000	48,277	47,273	1,280,102	27.06	47,273	1,280,102	27.06
Mesilla Valley.....	11,000	9,870	9,640	272,542	28.27	9,640	272,542	28.27
El Paso Valley.....	6,621	5,598	5,598	53,521	9.56	53,521	53,521	9.56
Oregon:								
Baker.....	14,053	10,838	10,500	134,686	12.82	792	695	695
Umatilla.....	7,878	6,904	6,579	97,842	13.35	97,842	97,842	13.35
East division.....	6,175	3,984	3,921	46,844	11.94	46,844	46,844	11.94
West division.....	15,584	4,915	3,608	34,016	9.43	34,016	34,016	9.43
Vale.....	61,334	50,060	49,027	812,175	16.56	64,468	34,105	34,105
Oregon-California:								
Klamath.....	41,122	32,293	31,940	524,302	16.40	524,302	524,302	16.40
Main division.....	20,212	17,767	17,087	287,873	16.85	287,873	287,873	16.85
Tule Lake division.....	57,112	35,000	6,49,129	601,121	12.24	601,121	601,121	12.24
South Dakota: Belle Fourche.....								
Utah:								
Salt Lake Basin.....	40,930	38,906	37,232	646,050	17.35	84,636	81,885	80,482
Strawberry Valley.....	18,633	17,704	16,823	209,184	12.43	18,633	5,735	5,660
High Line division.....	13,798	13,272	12,579	265,908	20.72	13,272	12,579	12,579
Spanish Fork division.....	8,499	7,930	7,930	150,958	19.56	150,958	150,958	19.56

Data are for calendar year (irrigation season), except on Salt River Project, where data are for corresponding "agricultural year" October 1931 to September 1932.

Areas for which Bureau was prepared to supply water in 1932

Bitter Root Irrigation District was organized in 1932. It is located in Lincoln County, Idaho, and includes parts of the Bitter Root Valley and the valley of the South Fork of the Snake River.

United States under act of July 3, 1930.

Includes some dry-farmed tracts irrespective of the area given below, under "Cropped without

Estimated.

GENERAL LAND OFFICE

(FRED W. JOHNSON, Commissioner)

The work of the General Land Office originates through the administration of the public land laws enacted by Congress. Its volume depends upon the degree to which citizens, associations, other Federal agencies, and the States avail themselves of their legal rights, and is in no manner within the control of the office. The appropriations for the operating expenses of the Land Service were reduced from \$2,224,400 for the fiscal year 1932, to \$2,033,300 for the fiscal year 1933, and a corresponding decrease took place in personnel of from 641 to 583 employees. Notwithstanding these reductions the work of the office, which is constantly increasing in complexity, may, as a whole, be reported as current. During the fiscal year the total original public land entries, including those on Indian lands, fell to 3,117,781 acres from 4,551,774 acres the previous year. The acreage included in public land entries is not, however, an infallible yardstick with which to measure the work accomplished, for each year adds to the already intricate land system many new laws that further complicate the work; 71 public land laws were enacted during the second session of the Seventy-second Congress and first session of the Seventy-third Congress that affect the activities of the office.

Homestead entries continued to account for over 87 percent of the public lands appropriated. Nearly three fourths of the lands homesteaded during the year were in the four Rocky Mountain States of Montana (233,237 acres), Wyoming (678,777 acres), Colorado (254,228 acres), and New Mexico (721,579 acres). The geographic center of homestead entries remains, as for the past 10 years, in northwestern Colorado, but the geographic center of the vacant, unappropriated and unreserved public lands is 300 miles west on the Utah-Nevada boundary near Ely, Nev. There remained on June 30, 1933, 172,084,-580 acres, exclusive of Alaska, of vacant, unappropriated and unreserved public lands.

In the annual report of the Commissioner of the General Land Office for the fiscal year ended June 30, 1930, attention was called to a number of uncontrolled fires in the coal beds on the public domain, particularly in Colorado, Montana, North and South Dakota, Utah, and Wyoming, which have been burning for years. Under authority of the Emergency Conservation Act, approved March 31, 1933 (Public No. 5, 73d Cong.), for the relief of unemployment through the performance of useful public work and for other purposes, a

camp was established in May to control a number of these coal fires in the Little Thunder Basin, Wyo. The superintendent and foremen were selected from those having years of experience in coal mining and kindred work in the coal fields of Wyoming, and at the close of the fiscal year the camp of 200 workmen was completely organized and work commenced on five separate and distinct fires.

Three important changes in organization took place during the year. In July 1932 the Public Survey Offices at Phoenix, Ariz.; Reno, Nev.; and Olympia, Wash., were reduced from operating and record offices to record offices only; in January 1933 four district land offices located at Little Rock, Ark.; Gainesville, Fla.; Cass Lake, Minn.; and Alliance, Nebr., were closed and the business transferred to the General Land Office, and in April 1933 the entire field service was transferred to and consolidated with the Division of Investigations in the Department of the Interior. In the following tabulation is presented a résumé of the acreage of public land disposed of during the year:

ORIGINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	4,752	2,297,931	132	60,300
Enlarged.....	473	120,739	17	2,861
Reclamation.....	59	5,623	14	1,512
Forest.....	60	5,546	2	200
Sec. 2289 et al.....	2,183	212,142	77	7,175
Total homesteads.....	7,527	2,641,981	242	72,048
Deserts.....	88	10,029	1	82
State selections.....	641	369,973	-----	-----
Railroad selections.....	15	11,590	-----	-----
Indian allotments.....	14	1,815	-----	-----
Applications and filings.....	161	-----	6	-----
Miscellaneous.....	47	10,261	2	2
Total.....	8,493	3,045,649	251	72,132
Indian land as above.....	251	72,132	-----	-----
Grand total.....	8,744	3,117,781	-----	-----

FINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	1,726	715,017	49	17,623
Enlarged.....	369	94,491	31	5,952
Reclamation.....	126	10,953	10	961
Forest.....	61	6,094	1	160
Commututed.....	21	1,751	-----	-----
Sec. 2289 et al.....	784	80,023	65	5,384
Total homesteads.....	3,087	908,329	156	30,060
Deserts.....	91	12,199	1	244
Public auction.....	140	10,740	8	849
Timber and stone.....	22	2,093	-----	-----
Mineral.....	115	8,603	1	44
Miscellaneous.....	213	4,625	70	2,370
Total.....	3,668	946,589	236	33,567
Indian land as above.....	236	33,567	-----	-----
Grand total.....	3,904	980,156	-----	-----

PATENTS AND CERTIFICATIONS

	Number	Acres
Homesteads:		
Stock raising.....	1,917	885,453
Enlarged.....	490	123,245
Reclamation.....	213	18,622
Forest.....	74	7,719
Commutated.....	37	3,352
Sec. 2289 et al.....	933	104,820
Total homesteads.....	3,664	1,143,211
Deserts.....	104	13,204
Public auction.....	152	12,321
Timber and stone.....	32	2,698
Mineral.....	194	18,596
Miscellaneous.....	4,958	563,829
Total patents.....	9,104	1,753,859
Certified to States.....		201,844
Grand total.....	9,104	1,955,703

LEASES AND PERMITS OUTSTANDING ON JUNE 30, 1933

	Leases		Prospecting permits	
	Number	Acres	Number	Acres
Oil and gas.....	802	258,063	4,443	7,382,506
Coal.....	421	81,033	270	228,867
Potash.....	13	30,745	212	455,612
Sodium.....	1	640	25	34,013
Phosphate.....	8	5,382		
Nonmineral, excluding grazing.....	74	162,475		
Total.....	1,319	538,338	4,950	8,100,998

RECEIPTS AND EXPENDITURES

Cash receipts.—The total cash receipts from sales, leases, and other disposition of public lands (including receipts from copies of records, sales of Government property, etc.) were \$3,812,208.11 and from proceeds of Indian lands \$47,222.86, an aggregate of \$3,859,430.97, all of which was deposited in the Treasury.

Receipts under Mineral Leasing Act.—Receipts of the Federal Government from bonuses, rentals, and royalties under the act of February 25, 1920, providing for the leasing of mineral rights on the public domain, aggregated \$3,256,440.19. The largest receipts were from mineral lands in California, the amount under this act being \$1,643,222.88. Wyoming came second with receipts totaling \$1,224,017.37. Receipts from the other States were: New Mexico, \$139,092.96; Utah, \$79,856.89; Montana, \$57,715.57; Colorado, \$53,400.04; North Dakota, \$33,515.65; Washington, \$9,537.22; Alabama, \$9,101.90; Louisiana, \$4,813.02; Idaho, \$1,225.44; South Dakota, \$498.05; Nevada, \$240; and Arizona, \$203.20. These figures do not include \$14,377.91 received as royalties in the State of Wyoming under the act of June 26, 1926, of which the State does not receive a share, nor \$7,834.28 received as royalties on coal leases in Alaska, of which the Territory receives no share. Under the provisions of the Mineral Leasing Act of February 25, 1920 (41 Stat. 437), the State receives 37½ percent of bonuses, rentals, and royalties thereunder from the public lands within its borders, the reclamation

fund receives 52½ percent, and the other 10 percent remains in the Treasury to the credit of miscellaneous receipts.

Distribution of receipts.—The aggregate receipts for the year, \$3,859,430.97, are distributed under the law approximately as follows: Reclamation fund, \$1,981,445.99; to the public-land States and certain counties within such States, \$1,328,585.59; general fund, \$502,176.53; and to the various Indian tribes \$47,222.86. Five percent of the net proceeds from cash sales of public land is paid to the public-land States within which such sales were made, and the balance of such net receipts from States named in the reclamation act is credited to the reclamation fund; 90 percent of the receipts under the mineral leasing act are divided between the States from which the minerals (principally oil) were taken and the reclamation fund; the receipts from sales of reclamation town sites and rentals and royalties from potash leases are credited to the reclamation fund; all of the receipts from sales of land and timber in the forfeited Oregon and California railroad grant will likely be paid to certain counties in Oregon in lieu of taxes that would be collected by the counties if the lands were in private ownership; 25 percent of the proceeds from land and timber in the Coos Bay wagon-road grant is paid to the counties from which the proceeds were derived; and the receipts from Indian lands, with the exception of 37½ percent of the royalties from the Red River oil lands in Oklahoma, which are paid to the State, are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows the distribution of these moneys insofar as is possible before final settlement of all accounts by the General Accounting Office:

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation fund	State fund	Total
Sale of public land.....	\$30,287.14	\$73,526.16	\$4,501.83	\$108,315.13
Fees and commissions.....	58,325.84	196,567.91	-----	254,893.75
Bonuses, rentals, and royalties from mineral leases.....	354,956.45	1,700,919.30	1,214,942.35	1,327,018.10
Proceeds of land and timber in Oregon and California railroad grant.....	-----	-----	107,490.20	107,490.20
Proceeds of land and timber in Coos Bay wagon-road grant.....	5,812.41	-----	3,1,651.21	7,463.62
Fees from copies of records.....	9,515.26	-----	-----	9,515.26
Royalties on coal leases in Alaska.....	7,834.28	-----	-----	7,834.28
Royalties and rentals from potash deposits.....	-----	7,066.99	-----	7,066.99
Power permits.....	15,347.95	-----	-----	15,347.95
Sale of reclamation town sites.....	-----	3,365.63	-----	3,365.63
Sale of standing timber in Alaska.....	6,326.73	-----	-----	6,326.73
Miscellaneous (surveying fees, rent of lands, forfeiture of contractors bonds, proceeds of Government property, etc.).....	13,770.47	-----	-----	13,770.47
Total.....	502,176.53	1,981,445.99	1,328,585.59	3,812,208.11
Sales and leases of Indian lands.....	-----	-----	-----	47,222.86
Aggregate.....	-----	-----	-----	3,859,430.97

¹ First and fourth column contain \$14,377.91 royalties received in Wyoming under the act of June 26, 1926.

² This amount is payable to certain counties in Oregon in lieu of taxes.

³ Amount payable to Coos County, Oreg., 25 percent of proceeds of land and timber.

⁴ Of the amount received as royalties from oil lands in the bed of the Red River, Okla., 37½ percent, \$7,534.20, is paid to Oklahoma, and the balance, \$13,557.94, is credited to the Kiowa, Comanche, and Apache Indians.

Expenditures.—Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices (\$226,491.08) amounted to \$1,781,164.20. Disbursements from deposits by individuals for surveys or resurveys (now carried under the title Expenses, public survey work, special fund), \$11,690.50, and from appropriations for surveying Indian reservations, \$28,224.82, are not included in above figures, either as receipts or expenditures.

REPAYMENTS

The act of June 16, 1880 (21 Stat. 287), and the act of March 26, 1908 (35 Stat. 48), as amended by the act of December 11, 1919 (41 Stat. 366), provide for the return of moneys received in connection with the disposal of public lands and covered into the United States Treasury. Repayment may be made to the land applicant or his heirs or assigns, where lands have been erroneously sold; where payments have been made in excess of lawful requirement; and where applications, entries, and proofs have been rejected, in the absence of fraud or attempted fraud. Under said laws there were stated 127 accounts, allowing repayment of \$17,596.18, and 84 claims were denied. The number of claims allowed includes 7 accounts granting repayment of \$6,848.19 received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

FIELD SERVICE

The investigation forces of the Department of the Interior were consolidated into a single unit under a director of investigations, Mr. Louis R. Glavis, on April 27, 1933. This consolidation was to prevent duplication of work and to bring all investigational matters under the immediate supervision of the Secretary of the Interior both for economy and efficiency.

The appropriation for this service for the fiscal year 1933 was \$400,000. Of this sum \$60,000 was to be used for prevention and suppression of forest and other fires on the public lands, and for no other purpose, leaving the net sum of \$340,000, to which was added \$60,000 transferred from National Parks appropriation (roads and trails), making \$400,000 available for the prosecution of routine work.

Personnel.—The average number of active field investigators, exclusive of 6 special agents in charge of the divisional offices, was 69; average number of clerks in divisional offices, 20; total force employed, including special agents in charge, 95.

Collections and restorations.—Due to the activities of special agents, \$31,497.85 was collected and turned into the Treasury and 177,291.74 acres were restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

Investigations.—On July 1, 1932, there were pending field investigation 11,006 cases. During the year 13,509 additional cases were received; 11,029 were investigated, reported and closed, leaving 11,552 pending investigation as against 11,006 the previous year. Of the 11,029 reports submitted, 4,075 were adverse and 6,954 favorable; 1,934 cases were closed without field investigation.

Action in courts.—On the recommendation of this Department 28 civil suits were brought by the Department of Justice. Cases tried numbered 35, of which 32 were won and 3 lost. As a result of the suits, \$13,678.90 were recovered and 6,644.28 acres were restored to the public domain. Offenses against the public land laws were responsible for 19 indictments. Of the criminal cases tried, three resulted in conviction and prison sentence was imposed in one case. Fines were imposed to the amount of \$2,775. The number admitted to practice before the Department for the fiscal year was 25.

Forest fires.—The appropriation for protecting public lands, timber, etc., 1933, included \$60,000 for prevention and suppression of forest and other fires on public lands, to be available for this and no other purpose, of which \$42,661.33 was spent.

CADASTRAL ENGINEERING SERVICE

Organization.—In order to keep within our greatly reduced appropriation for surveying the public lands it was necessary to curtail our program for surveys and resurveys in the field. The public survey offices at Phoenix, Ariz.; Reno, Nev.; and Olympia, Wash., had to be reduced in personnel early in the year and changed from field, operating, cartographic and record offices to record offices only. The permanent force of the service was reduced during the year by 20 employees, leaving a total of 122 at the close of the year.

Appropriations.—The regular appropriation for surveying public lands was \$500,000, to which was added \$75,000 by transfer from the National Park Service under the provisions of the Economy Act of June 30, 1932. Of the total amount, \$41,646.14 was impounded in the Treasury in accordance with the requirements of the Economy Act. In addition, moneys derived from the following appropriations and funds were received and used during the year:

	Receipts	Impounded	Expenditures
Surveying and allotting Indian reservations, 1933.....	\$19,645.00	\$1,367.30	\$18,210.72
Quietling title, Pueblo lands, New Mexico, 1933.....	11,337.83	988.22	10,014.10
Expenses, public-survey work, general.....	9,867.33	890.73	8,976.60
Expenses, public-survey work, Alaska.....	1,359.59	84.40	1,274.53
Total.....	42,209.75	3,330.65	38,475.95

Thus the total expenditure for surveying and associated work was \$521,829.81, against \$763,271.52 in the previous year.

Income (public moneys).—Funds collected by this service and deposited in the Treasury during the fiscal year 1933 consisted of the following:

Deposits by individuals for surveying public lands (R.S. 2334)	\$5,734.80
Miscellaneous receipts: Copies of records.....	2,060.00
Proceeds, sales of Government property.....	576.00
Total.....	8,370.80

Summary of work.—Cadastral surveying projects were carried on in 21 States and the Territory of Alaska under 209 groups, of which 47 in 12 States were of resurveys. On such of the work as is measurable on a quantity basis, 19,364 linear miles were surveyed at an average cost of \$14.33 a mile, against \$18.32 in the previous year. In view of the reduced appropriation, the mileage accomplished is unusually large and the costs proportionately small, but increased mileage in the circumstances always means the curtailment of activities in that vast field of cadastral work where survey accomplishment cannot be gaged in terms of linear miles or area. Many important projects of this type and in the work as a whole were necessarily postponed until funds are available for their completion.

During the year just closed approximately 1,907,000 acres of agricultural lands in addition to the projects not measurable in area were surveyed in the United States proper and Alaska, the larger volumes being in the States of Arizona, California, Nevada, Idaho, and New Mexico. A total of 75,000 acres of nonagricultural and mineral lands were surveyed. In addition cooperative surveys were executed on the national forests, in connection with the boundaries of national parks and monuments, on leased coal and oil lands, and water power sites. Approximately 815,440 acres of lands were resurveyed in 14 States.

Indian surveys.—There was available \$19,645 for surveying and allotting Indian reservations during the fiscal year 1933. Consequently the work was confined to a limited number of important projects. The work included extension of the surveys already initiated on the Leech Lake Reservation, Minn.; the Cheyenne River, S.Dak.; and the Mescalero-Apache, N.Mex. Among the minor undertakings were the lowland survey on the Gila River Reservation, Ariz.; surveys on the Yuma Reservation along the abandoned channel of the Colorado River for use in an eviction suit instituted by the United States; resurveys in the vicinity of Barona ranch, California, to define the lands recently purchased by the United States and administered by the Indian Office; the survey of a tract of Cherokee Indian land on the Qualla Reservation, N.C.; and a special survey

on the Navajo Reservation, Ariz. A total of 131 tracts were surveyed on the Santa Clara Indian Pueblo, N.Mex., ranging in size from a fraction of an acre to over a hundred acres.

Office work.—Surveys and resurveys in 271 townships were platted and approved, 400 supplemental and segregation plats were constructed, exclusive of 38 supplemental plats accompanying survey returns, and the work of examining, platting and approving 72 mineral surveys, embracing 190 locations, at an average office cost of \$25.47 per location, was accomplished. There were also prepared 75 plats to accommodate tracts to which Indian title had been extinguished on the San Juan, San Ildefonso, and San Felipe Pueblos in New Mexico, and 30 plats of isolated tract surveys in Alaska. In addition the returns of 6 forest homestead entry and exchange surveys in the States were examined and approved and special maps of the Boulder Canyon Reservation were compiled.

Accepted surveys.—There were accepted and placed on file plats representing 1,222,777 acres of original surveys of public lands, and in addition 1,380,643 acres of lands resurveyed, comprising an aggregate area of 2,603,420 acres, against 2,366,313 acres in the previous year.

CARTOGRAPHIC ENGINEERING SERVICE

Map of the United States.—The copper plates for the map of the United States have been revised to show current changes and additions to the public-land surveys since the publication of the 1931 edition. New maps of Idaho and Oregon have been issued. The new maps of Arizona and Alaska are ready for printing. Recompilation of the map of Colorado is in progress. A large map, 11 by 14 feet, of the United States was made as part of the General Land Office exhibit at the Century of Progress Exposition at Chicago. Various maps were prepared for committees of Congress and on subjects of departmental interest. There were sold 7,574 photolithographic copies of township plats, for which \$3,787 was received, and 4,379 were furnished other departments for official use. There were mounted 1,857 maps and distributed 3,990 map publications and 228,411 circulars covering the various public-land laws and regulations.

HOMESTEADS AND ASSOCIATED ENTRIES

Homestead and associated entries brought over from last year were 4,916. There were received 36,246 cases, as against 38,088 in the previous year. Pending at end of the year were 5,153 cases. Patents approved included 4,488 homestead entries as against 5,639 the previous year. There were also acted upon 1,079 applications to make second homestead entry as against 1,837; 858 applications to amend as against 802; 1,946 applications for leaves of absence and

for extension of time to establish residence as against 1,008; 9,057 original entries as against 8,033; 15,466 appeals from action of district land officers and this office as against 14,875, making a total of 28,406 applications for second homestead entry, amendments, extension of time and leaves of absence, original homesteads, and appeals acted upon during the year as against 26,555 the previous year.

Public sale applications under section 2455, revised statutes as amended, receiving action were 1,153, against 1,089 the previous year, of which 103 public sales were approved for patenting as against 286 the previous year. Timber and stone cases acted upon were 294 as against 324 the previous year, of which 58 were approved for patenting as against 90 the previous year. There were 17,701 acres returned to the national forests by revocation of orders which had subjected the lands to homestead entry under the act of June 11, 1906, but upon the recommendation of the Department of Agriculture 618 acres in national forests were made subject to such homestead entry.

RESTORATIONS, OPENINGS, AND PREFERENCE RIGHTS OF EX-SERVICE MEN

Under the practice of filing plats of survey and resurvey for lands in States having district land offices, this office issues instructions to the district officers concerning the filing of the plats, the opening of the lands to entry and disposal, the effect had thereon by any withdrawals and reservations, and the preference rights of former service men and others. This office also prepares and later promulgates Executive orders revoking Executive orders of withdrawal. During the past fiscal year letters of instructions have been issued involving 303 plats against 270 in the previous year. In addition, 11 plats for lands in States having no district land office were directly filed in this office and 22 public notices were prepared in connection therewith. Public lands opened to entry through release from withdrawals or through survey or resurvey aggregated 2,473,190 acres. These openings were made subject to the preference rights of ex-service men under joint resolution approved June 12, 1930 (46 Stat. 580).

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—On July 1, 1932, there were 21 cases pending for action under sections 14, 17, 18, 18a, and 19 of the act of February 25, 1920 (41 Stat. 437). During the year 1,401 cases were received under above sections, 1,293 were acted upon as compared with 1,209 in the previous year, and 129 remained awaiting action on June 30, 1933. The leases issued during the year were 23 under section 14 for 11,083.19 acres, all resulting from discoveries of oil and

gas on prospecting permits. Eight leases were canceled in entirety and six in part. At the end of the year 802 oil and gas leases embracing 258,063.36 acres were pending.

Oil and gas prospecting permits.—There were 1,149 permits granted, 35 of which were applications filed prior to March 13, 1929, when the Secretary of the Interior refused to permit the filing of further applications for oil and gas prospecting permits. The remainder were granted under the regulations of April 4, 1932, under which permit applications were again received. Nine permits which had been canceled were reinstated. There were 127 assignments acted upon and 1,466 applications for extension of time were considered. During the year 591 permits were held for cancelation and 436 permits were canceled, of which 47 were in Alaska; 568 applications were finally rejected and 755 applications were finally rejected in part. There were 10,369 other actions taken, leaving 2,001 cases pending and awaiting action at close of the year, including 1,634 applications filed under the regulations of April 4, 1932. There are now outstanding 4,443 permits covering 7,382,506.52 acres.

Coal.—At the beginning of the year 100 cases were pending for coal permits, licenses, and leases, and 2,411 cases were received. There were issued 84 coal prospecting permits covering 48,175.03 acres, 32 coal licenses for 1,360.25 acres, and 35 coal leases for 3,316.13 acres. The total number of cases disposed of was 2,413 against 2,153 in the previous year, leaving 98 cases on hand. There are now outstanding 327 leases covering 76,350.15 acres, 94 licenses for 3,733.07 acres, and 270 prospecting permits for 228,867.47 acres.

Potash, sodium, and phosphate.—There were 78 potash permits involving 161,724.78 acres and 3 potash leases covering 8,478.71 acres issued during the year under the acts of February 25, 1920, and December 11, 1928. The total potash leases are now 13, embracing 30,745.24 acres, and the permits are 212 for 455,612.81 acres. Fourteen sodium permits covering 15,665.34 acres and one sodium lease for 640 acres were issued. There are now outstanding the 1 sodium lease and 25 permits for 34,013.85 acres. Four phosphate leases covering 2,482.90 acres were granted, which bring the total outstanding up to eight leases embracing 5,382.90 acres. Sixty cases involving the above three minerals were pending at the opening of the year and 828 were received; 880 cases were disposed of, leaving 8 cases awaiting action.

Receipts under mineral leasing act.—The receipts for the year under the mineral leasing act of February 25, 1920, were \$2,969,201.72 from oil and gas, \$259,907.79 from coal, \$24,888.93 from potash, \$1,998.55 from phosphate, and \$443.20 from sodium, making the total receipts \$3,256,440.19. The disposition made of these receipts will be found under the title of Receipts and Expenditures.

Oil-shale claims under patent proceedings.—There were pending at beginning of the year 14 mineral applications for 124 oil-shale claims embracing 19,179 acres, and they are still awaiting final action. There were also pending 28 mineral entries for 184 claims covering 24,175 acres and during the year 1 entry was received for 5 claims of approximately 808 acres. There were approved for patenting 7 entries for 56 claims covering 4,997 acres, and 8 entries were canceled for 53 claims covering 8,076 acres. There are still awaiting action 14 mineral entries for 80 claims covering 11,910 acres.

Oil-shale locations.—Forty-nine field reports on locations not included in patent proceedings were awaiting action on July 1, 1932, and 116 were received; all were acted upon. Charges were directed against 873 locations embracing 113,490 acres.

Oil-shale contests.—There were 120 contests against oil-shale locations pending at the beginning of the year, including locations under patent proceedings; 1,655 new cases were added and 1,615 were disposed of, leaving 160 pending. Locations to the number of 11,146 for 1,448,980 acres were declared null and void.

Mineral entries and applications.—There were brought forward from last year 63 mineral entries; 469 were received and 481 adjudicated, leaving 51 awaiting action. There were approved for patenting 201 entries. On July 1, 1932, there were pending 6 mineral applications; 132 were received and 124 disposed of, leaving 14 on hand.

Miscellaneous mineral cases.—There were on hand at the beginning of the year 81 miscellaneous mineral cases; 676 were received and 682 disposed of, leaving 75 awaiting action. These cases were of a highly miscellaneous nature, such as conflicts between mineral and nonmineral claimants, requests for segregation of mining claims, and adjudication of field reports.

Mineral contests.—Exclusive of oil shale, Boulder Dam and Reservoir project, and the San Gabriel Canyon claims, there were 54 mineral contests pending July 1, 1932; 208 were received and 229 disposed of, leaving 33 awaiting action.

MISCELLANEOUS LEASES

Aviation fields.—During the year applications for the use of public lands as aviation fields were considered in 51 instances and 3 leases were issued, and the assignment of 1 lease was approved. Two new applications were received, while 3 applications to erect beacon lights were rejected. There are 13 leases outstanding and 5 permits for beacon lights, totaling 5,196.64 acres.

Fur farming.—The office considered 185 applications for leases on land in Alaska for purposes of fur farming with the following results:

5 applications were rejected, 8 leases were issued, 1 lease was reinstated, 2 leases were canceled, and the assignment of 1 lease was approved. Four new applications for lease were received and await reports from the field for further action. There are 41 leases which are still in full force and effect with an area of 143,712.92 acres.

Stock grazing, Alaska.—Leasing of public lands in Alaska for grazing purposes was considered during the year in 242 instances and 12 applications were rejected, 6 leases were issued, 4 leases were canceled, and the assignment of 1 lease was approved. Ten new applications were received during the year and further action thereon awaits reports from the field. There are 17 leases outstanding under the above act embracing 10,549,449 acres. Six of these leases were granted to associations of natives for grazing of reindeer. The other 11 were leases for grazing cattle, horses, or sheep.

TOWN SITES, PARKS, AND CEMETERIES

Alaska.—During the year patents were issued to the town-site trustee for several Indian villages in Alaska, including Hydaburg, Seldovia, Kake, and Angoon. On July 25, 1932, regulations were issued providing for the relinquishment by the State of Arizona and the city of Tempe, Ariz., of certain lands and the patenting of some of the lands to the Salt River Valley Water Users Association and another part of the lands to the town of Tempe, Ariz., for park purposes. The survey of lots for the town site of Oro Fino, Calif., has been ordered. The town-site reservations for the proposed town sites of Sprole, Mont., and Huberton, N.Dak., were vacated during the year. On August 15, 1932, regulations for the sale of town lots in the town site of Wadsworth, Nev., were prescribed. On July 28, 1932, regulations were issued under the act of July 8, 1932 (47 Stat. 649), which provided for the conveyance to the city of Fallon, Nev., of certain lands for a dumping ground. The survey of the town site of Texhoma, Okla., has been approved and the disposition of the lots developed by the survey is now under consideration.

Parks and cemeteries.—Under the act of September 30, 1890 (26 Stat. 502), providing for cemeteries and parks for cities and towns, there were 13 cases considered during the year and patent was issued for 1 cemetery site. Patents for parks and public reservations under individual acts were issued to the towns of Deaver and Powell, Wyo., and Plummer, Idaho. The lease of Sibley Island in the Missouri River to the city of Bismarck, N. Dak., for park purposes, pursuant to the act of June 11, 1896 (29 Stat. 413-435), was held for cancellation for failure of the city to comply with the terms of said lease.

TRESPASS

During the year the following number of trespass cases were considered: 651 timber, 965 coal, 2 fire, 9 gravel, 3 grazing, 2 cactus, and 1 turpentine. Settlements totaling \$9,963.86 were accepted in the timber cases while the sum of \$5,329.75 was accepted for coal trespasses. In four cases criminal prosecution was recommended. There were also considered during the year 68 cases of unlawful enclosure of public lands, which resulted in the abatement of such unlawful enclosures and the release therefrom of several thousand acres of public land.

ABANDONED MILITARY RESERVATIONS

During the year the sum of \$4,952.56 was realized from sales of lands of the abandoned military reservations of Fort Lowell, Ariz.; Vashon Island, Wash.; Point Campbell, Alaska; and Fort Assiniboine, Mont. Cases of this type were considered in 146 instances, resulting in 23 patents being issued on sales of land and 15 patents on homesteads. Under the act of May 2, 1932 (47 Stat. 141), a patent was issued to the State of Minnesota for a tract of land which was formerly a part of the Fort Ripley Military Reservation.

PRIVATE LAND CLAIMS

The present title of land, to which claims had attached while under the jurisdiction of former governments, continues to be a source of official correspondence and action. Inquiries are received from 143 present owners of such land and from abstract companies or title examiners in behalf of such owners, seeking to ascertain the source and nature of the title and to procure patents as evidence of their title. Inquiries are received from those whose ancestors were among the early inhabitants of the ceded territory, who seek to ascertain whether or not some right or title to such tracts still remains in the Government from which they could derive some benefit or to renew a claim that has been rejected. Six patents were issued during the year in private claim cases.

RIGHTS-OF-WAY

Railroad rights-of-way.—Forty-eight railroad rights-of-way applications were received during the year, which added to the 14 pending, made a total of 62. Twenty-two were approved, requirements made in 36, leaving 4 pending. One hundred and eight reservoir declaratory statement applications were received, which, added to the 5 pending, made a total of 113. Requirements were made in 40 cases, 71 were otherwise disposed of, leaving 2 pending. Six hundred and thirty-five irrigation, telegraph, telephone, public road, pipe line,

etc., applications were received, which, added to 13 on hand, made a total of 648. One hundred and ninety-four were approved, 34 canceled, and requirements made in 404, leaving 16 not yet considered. One hundred and forty maps of approved rights-of-way in forest and Indian reservations were received from the Forest Service and Indian Office and approvals promulgated. The number of approved rights of way of all kinds which were awaiting office action July 1, 1932, was 15, those received 522. Of these, there were canceled by relinquishment or default 30, requirements were made in 290 cases, and 196 were otherwise disposed. Three suits were recommended and four decrees of forfeiture obtained as a result of previous recommendations. Twenty-six suits are pending in the Department of Justice.

STATE GRANTS AND SELECTIONS

Indemnity.—At the beginning of year 145,286 acres of school-land indemnity selections were awaiting action and 1,361,841 acres of new selections were received during the year. Of these, 115,191 acres were approved and certified to the States, 4,862 acres were canceled, 6,254 acres otherwise disposed of, and requirements made as to 902,609 acres, leaving 478,211 acres awaiting consideration at end of year. New quantity selections under grants for specific purposes consisting of 75,017 acres, and selections in connection with which requirements had been made embracing 267,584 acres, together with 60,821 acres not theretofore considered, totaled 403,422 acres. Of this amount, 86,653 acres were approved and certified to the States, selections embracing 3,399 acres were canceled and requirements were made as to 246,262 acres, leaving 67,108 acres not yet taken up for action. Conveyances amounting to 9,090 acres were made to the States with reservation of certain mineral deposits to the United States, including coal, oil, gas, potash, and oil-shale. In addition thereto, 10,196 acres were conveyed to the State of Nevada with a reservation to the United States of all mineral deposits therein.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections were received to the extent of 201,673.50 acres; 77,273.29 acres were certified or patented in satisfaction of such grants; 7,096.06 acres of selections were rejected; the total acreage adjudicated being 227,087.69.

OREGON AND CALIFORNIA TAX UNIT

Payments to 18 counties in the State of Oregon in lieu of taxes, involving approximately 2,300,000 acres of land, title to which re vested in the Government are made by the United States. The rates are fixed by lawful annual levies on these lands in the same man-

ner as those held in private ownership in the several counties, and the valuations are those used by the Secretary of the Interior in computing the accrued taxes for the year 1915, as reduced by disposal made since 1915. The counties present their claims annually and they are checked and audited by this office and certified to the Secretary of the Treasury for payment in the amounts found to be due. It is necessary to determine from the records and the proofs submitted not only the State and county taxes, but also whether the land is subject to the school, high school, road, port, or other special district tax claimed. A special set of records is kept where each disposal of revested land is noted. The auditing and adjudication of the claims has resulted in net deduction on all claims, or savings to the Government of approximately \$310,000. Following is a tabulation of the tax claims on hand July 1, 1932, and of the claims received and disposed of during the fiscal year 1933:

Claims pending on July 1, 1932:

3 claims for year 1931-----	\$73, 203. 08
Claims received during fiscal year 1933:	
6 claims for year 1931-----	94, 453. 66
18 claims for year 1932-----	491, 936. 02

Total----- 586, 389. 68

Claims certified during fiscal year 1933:

9 claims for year 1931-----	167, 544. 21
Net disallowance in above claims-----	112. 53

Claims pending on June 30, 1933:

All 1932 claims----- 491, 936. 02

NOTE.—Nine claims for the year 1931 were certified during the fiscal year 1932 in the sum of \$308,016.42, which was \$1,808.73 less than the amount claimed.

Payments on the 1932 claims amounting to \$491,936.02 have been withheld in accordance with the Comptroller General's decision of April 28, 1933, due to shortage of moneys in the fund from which payments have been heretofore made.

Contests

	Pending June 30, 1932	Received	Decided	Pending June 30, 1933
Mineral-----	54	208	229	33
Oil-shale-----	120	1,655	1,615	160
Boulder Canyon project-----	13	17	29	1
San Gabriel Canyon, Calif-----	83	115	193	5
Miscellaneous, Government, and private-----	542	1,861	1,771	632
Total-----	812	3,856	3,837	831

The cases decided in the previous year were: 129 mineral, 1,777 oil-shale, 428 Boulder Canyon project, 163 San Gabriel Canyon and 1,714 miscellaneous.

WITHDRAWALS AND CREATIONS

Withdrawals of public lands from settlement are made by acts of Congress, by presidential order, or by departmental order where authorized by specific act of Congress. Seven new stock driveways were established during the year and 27 were modified, resulting in the withdrawal of 187,297 acres and the releasing of 60,346 acres from former withdrawals.

There were withdrawn from the unreserved public land 145,344 acres for forest purposes and 25,741 acres were restored. The existing temporary withdrawals for forestry purposes on June 30, 1933, were 131,168 acres, including 17,898 acres withdrawn outside of forest boundaries for administrative sites. During the year 86,256 acres were withdrawn from the unreserved public land for creation of parks and monuments and 778,570 acres were restored. The outstanding withdrawals for the creation of further parks and monuments amount to 2,790,109 acres. There were also 178,309 acres withdrawn for game and bird refuges while 860 were withdrawn for recreational areas. Several small areas aggregating 3,184 in Arizona, California, Nevada, Oregon, and Washington for use of the Department of Commerce as beacon sites or intermediate landing fields in the maintenance of air navigation facilities. At the same time, 2,321 acres were released from such withdrawals.

Public water reserves are created to insure that sources of water in the arid regions will remain open for the public and for livestock. They are also made for the protection of municipal and other public water supplies and are practically net Government land. During the year 33,784 acres were withdrawn and 3,612 acres therefore withdrawn were restored. The outstanding reserves are 471,401 acres. Under Executive order of April 17, 1926, all springs and waterholes providing enough water for general use for watering purposes were automatically withdrawn from entry by requiring with every entry an affidavit of the nonexistence of such a source of water.

Withdrawals for miscellaneous purposes amounting to 63,269 acres were made and 6,979 acres were restored. The outstanding withdrawals for miscellaneous purposes are estimated at 500,000 acres. A summary of the withdrawals existing June 30, 1933 follows:

	Acres
Stock driveways-----	9,662,906
Recreational area withdrawals-----	281,876
Air navigation sites-----	34,000
Carey Act withdrawals and segregations-----	932,092
Reclamation withdrawals-----	20,164,315
San Carlos irrigation project (Indian)-----	136,860
Water-power reserves (excluding Indian)-----	5,000,683
Reservoir sites-----	254,010
Public water reserves-----	471,401

	<i>Acres</i>
Grazing districts, California and Montana-----	560, 404
Oregon, California, and Coos Bay unrestored timberland-----	1, 260, 854
For Boulder Canyon transmission line-----	2, 040, 210
For forest exchange with State of New Mexico-----	240, 000
For national forest purposes-----	131, 168
For grazing districts in Montana-----	367, 320
For New Mexico-Arizona Indian consolidation-----	1, 134, 972
For national parks and monuments-----	2, 790, 109
For game and bird refuges-----	250, 288
For miscellaneous purposes (estimated)-----	500, 000
 Total-----	46, 213, 468

The above withdrawals are estimated to contain 27,068,532 acres of Government land in the public-domain States.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

Mineral withdrawals relate to subsurface rights as the surface is usually open to agricultural entries unless a reservation of the surface is also necessary to effect the purpose of the withdrawal. During the year there were restored 1,421,250 acres from coal withdrawals and 2,019,369 acres from oil-shale withdrawals. The outstanding withdrawals for classification, and the further area now classified as mineral, are as follows:

	Withdrawn	Classified
	<i>Acres</i>	<i>Acres</i>
Coal-----	28, 255, 604	32, 645, 314
Oil and gas-----	5, 259, 426	71, 884
Oil shale-----	6, 238, 545	4, 061, 997
Phosphate-----	2, 004, 765	302, 219
Potash-----	9, 411, 906	-----
Helium-----	12, 255	-----
Metalliferous-----	8, 507	-----
 Total-----	51, 191, 008	37, 081, 414

The above areas contain much land patented without mineral reservation. In more definite reservations are the naval oil reserves of 77,730 acres, the naval oil-shale reserves of 156,024 acres, and 944,951 acres defined as within the known geologic structure of producing oil and gas fields; these are the gross areas before deducting the private lands.

DISPOSITION OF PUBLIC DOMAIN

The term "public domain" embraces all of the area that was once public land or in the control of the Federal Government, including Alaska. In the United States proper it includes all the States north and west of the Ohio and Mississippi Rivers except Texas, and includes in addition the States of Mississippi, Alabama, and Florida. The total area of the public domain in the United States proper is 1,442,-

200,320 acres. The following is the disposition of this vast area as worked out from available records of disposals and with arbitrary adjustment for final entries and disposals that were later canceled and for exchanges, etc., that resulted in reissuance of patents, and with further adjustment due to purchases of patented lands by the Government for special purposes. The subject, which involves the history of the growth and development of our country, is complex and changing and subject to numerous classifications and exceptions, but the following table pictures the situation in its simplest form.

Title passed from the United States:

	<i>Acres</i>
Homesteads (approximate)-----	274, 000, 000
Cash sales and miscellaneous disposals (approximate)-----	418, 000, 000
State grants for educational or other purposes-----	181, 650, 470
Canal and river improvement grants to States-----	6, 842, 920
Wagon-road grants to States-----	3, 359, 188
Railroad grants to States-----	38, 206, 390
Railroad grants to corporations-----	94, 155, 512

Total area disposed of----- 1, 016, 214, 480

Pending and unperfected public land entries----- 23, 208, 704

Title remaining in the United States:

National forests-----	137, 576, 500
National parks and monuments-----	8, 370, 989
Indian reservations (estimated net)-----	56, 676, 535
Military, naval, experimental reservations, etc. (approximate)-----	1, 000, 000
Withdrawals (estimated net)-----	27, 068, 532
Unappropriated and unreserved public land-----	172, 084, 580

Grand total----- 1, 442, 200, 320

REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D.C.

The honorable the SECRETARY OF THE INTERIOR.

SIR: We submit herewith the annual report of the Office of Indian Affairs for the fiscal year ended June 30, 1933.

FOREWORD

The Indian Service is confronting certain main problems and is moving on certain main lines of policy. In part, these problems and these lines of policy are indicated in the narrative report for the fiscal year ended June 30, 1933.

(1) *Indian lands.*—The allotment system has enormously cut down the Indian landholdings and has rendered many areas, still owned by Indians, practically unavailable for Indian use. The system must be revised both as a matter of law and of practical effect. Allotted lands must be consolidated into tribal or corporate ownership with individual tenure, and new lands must be acquired for the 90,000 Indians who are landless at the present time. A modern system of financial credit must be instituted to enable the Indians to use their own natural resources. And training in the modern techniques of land use must be supplied Indians. The wastage of Indian lands through erosion must be checked.

(2) *Indian education.*—The redistribution of educational opportunity for Indians, out of the concentrated boarding school, reaching the few, and into the day school, reaching the many, must be continued and accelerated. The boarding schools which remain must be specialized on lines of occupational need for children of the older groups, or of the need of some Indian children for institutional care. The day schools must be worked out on lines of community service, reaching the adult as well as the child, and influencing the health, the recreation, and the economic welfare of their local areas.

(3) *Indians in Indian Service.*—The increasing use of Indians in their own official and unofficial service must be pressed without wearying. To this end, adjustments of Civil Service arrangements to Indian need must be sought; but in order that standards may not be

lowered, opportunities for professional training must be made genuinely accessible to Indians. With respect to unofficial Indian self-service, a steadily widening tribal and local participation by Indians in the management of their own properties and in the administration of their own services must be pursued.

(4) *Reorganization of the Indian Service.*—A decentralizing of administrative routine must be progressively attempted. The special functions of Indian Service must be integrated with one another and with Indian life, in terms of local areas and of local groups of Indians. An enlarged responsibility must be vested in the superintendents of reservations and beyond them, or concurrently, in the Indians themselves. This reorganization is in part dependent on the revision of the land allotment system; and in part it is dependent on the steady development of cooperative relations between the Indian Service as a Federal agency, on the one hand, and the States, counties, school districts, and other local units of government on the other hand.

The above main purposes will have to be sought in those months ahead which probably will bring a crisis in the economic situation of many tribes. Unemployment and distress are now widespread among the Indians, particularly, but not exclusively in the allotted areas.

The grant of \$5,875,200 for Indian emergency conservation work, made available June 19, will be an important means toward the alleviation of Indian distress, the granting of employment to unemployed Indians, the salvaging and improvement of many areas of Indian land, and the bolder use of Indians in their own professional service.

EMERGENCY CONSERVATION WORK

Under the act of March 31, 1933, President Roosevelt created a Civilian Conservation Corps composed of some 1,400 camps, each of 200 men enrolled for 6 months' service. Of the funds made available by that act, \$5,875,200 were placed at the disposal of the Indian Office, subject to the Director of Emergency Conservation Work, by Executive order of May 12, as amended on May 26 and June 7. Due to delays in perfecting accountancy arrangements, however, no part of that sum actually became available until June 20.

Because of the objections to locating quasi-military units on Indian lands, and because of the complexities of Indian affairs in general, President Roosevelt was convinced that the Indian program should be placed on a separate basis. The 200-men unit, particularly, was adjudged impracticable. The "Indian country" is proverbially a land of great distances; many of the reservations have no important forests; and there could be but few urgently needed work projects, in those sparsely settled regions, large enough to employ 200 men for anything like a 6-months' stretch. Many Indians would sacrifice

needlessly in contracting for a half year's continuous residence in remote camps, where they would be unable to get away for a few days at a time to attend to the seasonal needs of their crops or livestock. Most of the workers would be married and would be loath, for that reason, to sign up for so long an absence. Again, tribal life, as distinguished from family life, might empty the large and expensive encampments on the rather numerous days of tribal or religious festivals—this in addition to much wastage of money and time on transportation.

The President therefore authorized that Indians be mobilized into small work groups and that, in most instances, they live at home or—as experienced campers—maintain their own camps near “the job.” In those cases the allowances to workers for “commutation of quarters and subsistence” would probably cost the Government less—in both cash and man-days—than the constructing and maintaining of large camps.

The Indian program was given still further individuality by Director Fechner, who authorized the Indian Office to appoint its own erosion experts, engineers, and foresters and to do its own disbursing. And he liberalized the age limits of enrolled Indians. Enrollment in the Indian branch was opened to “persons over 18 years of age who are able to perform ordinary labor without injury to themselves” and who are free from communicable disease.

The preliminary allotting of the \$5,875,200—and the quotas of enrolled men by States—will necessarily be revised somewhat in the coming fiscal period. They were the result, nevertheless, of many overtime conferences, at which two considerations ruled: the relative poverty of Indians on different reservations and the relative need for constructive work that could be undertaken under the act of March 31. That work was pretty well limited to forestry and erosion control.

Work projects of wide variety were approved before June 30. Under prevention of forest fires, approved projects include: fire lanes, lookout towers, telephone lines, trails and bridges, roadside clearing and the removal of fire hazards elsewhere. Other forestry projects include nursery work, seed collection, planting, insect pest control, stand improvement, and in some instances landscaping. Under erosion control (largely through prevention of excessive grazing), work projects include erosion dams, range revegetation, boundary surveys, fences, driveways, corrals, springs and reservoirs, rodent control, eradication of poisonous plants, and elimination of useless range stock. Minor flood-control work has been authorized, notably in New Mexico. Improvement of public camp grounds will be a rather important item in most States.

Several of the earliest policies of the I.E.C.W.—as it has come to be known—will be rigorously administered. Supervisory jobs will be

limited. Indians will be given preference in filling all such jobs, from the outset; and they will "take over" as rapidly as they can be trained. Enrolled workers in general will be required to deposit a liberal portion of their earnings into the Individual Moneys, for use during the winter. Purchases of expensive equipment will be kept at a minimum, to insure that a maximum of the Indian fund will go into pay rolls, where it will most promptly serve the destitute.

APPROPRIATIONS

The appropriations for this year aggregated \$22,140,098.35 from the Federal Treasury. This is a decrease of nearly \$5,000,000 under the amount allowed for the previous year. For comparison purposes there follows a tabulation showing appropriations for the service over a 4-year period:

	1931	1932	1933	1934
General purposes.....	\$2,365,808.25	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00
Industrial assistance.....	1,674,000.00	1,605,000.00	1,301,000.00	1,233,881.67
Irrigation and water development.....	436,751.00	497,601.00	457,824.00	599,614.00
Education.....	8,583,398.59	10,185,400.00	9,771,000.00	9,103,230.00
Conservation of health.....	2,338,360.24	3,658,000.00	3,508,800.00	3,281,800.00
Support of Indians.....	1,918,280.00	2,216,300.00	2,156,300.00	2,141,900.00
Miscellaneous (roads, annuities, etc.).....	31,020.00	40,020.00	31,020.00	31,020.00
Subtotal.....	17,347,618.08	20,789,606.73	19,065,998.35	17,984,945.67
Construction.....	4,239,250.00	5,570,440.00	1,654,100.00	711,600.00
Roads.....	396,000.00	670,000.00	1,420,000.00	270,000.00
Total.....	21,984,868.08	27,030,046.73	22,140,098.35	18,966,545.67

In addition to the foregoing authorized expenditures from the general fund of the Treasury, specific appropriations from tribal funds have been made as follows:

	1931	1932	1933	1934
General purposes (including land).....	\$584,249.63	\$332,913.98	\$126,300.00	\$390,501.00
Industrial assistance.....	20,000.00	180,532.21	45,000.00	188,000.00
Irrigation and water development.....	28,500.00	49,500.00	59,000.00	46,950.00
Education.....	1,040,701.08	910,000.00	803,000.00	708,600.00
Conservation of health.....	100,000.00	125,000.00	125,000.00	131,550.00
Support of Indians.....	1,784,538.46	1,767,100.00	1,032,380.00	789,100.00
Miscellaneous (roads annuities, etc.).....	43,000.00	50,000.00	25,000.00	25,000.00
Total.....	3,600,989.17	3,415,046.19	2,215,680.00	2,279,701.00

To this latter class of funds are added certain amounts classed as permanent or indefinite appropriations. With the approach of the new year the service will be required to operate on even less than the amounts actually appropriated in order to make its contributions to the general economy movement.

From last year, 1932, to the coming year, 1934, beginning July, the Federal expenditures for the Indian Service have been cut from \$27,030,047 to \$16,586,059. The reduction is \$10,443,988, or 39

percent. The Indian tribal trust funds available for Indian Bureau costs have been reduced from \$3,385,934 to a sum approximating \$2,450,000—about a \$930,000 diminution. And the tribal trust funds available for payment in cash to the Indians have been reduced from \$3,289,160 to about \$2,000,000. A grand total appropriation of \$33,704,000 for 1932 is cut to approximately \$21,246,000 for 1934, and the total reduction is approximately \$12,458,000.

EDUCATION

Substitution of Federal day schools and public-school facilities for Government Indian boarding schools, a policy now well established in the Indian Service, gained considerable momentum during the last year from budgetary changes made necessary by the Government's economy program.

While this change has occasioned some temporary difficulties in adjustments of school personnel and care of children formerly in boarding schools, it will ultimately result in real benefit to the Indian people, for it carries Government efforts in education back to the reservations where the Indians live and develops local facilities for as many Indian children as possible.

Experience so far, this past year, has proved unusually satisfactory in the instances where change from boarding school to day school has already been accomplished. In enacting the 1933 appropriation bill Congress directed that \$500,000 be shifted from boarding schools to day schools. This shift was carried out with the effect of providing for twice as many Indian children a schooling of a better quality than had been enjoyed by the number transferred from boarding schools. School officials who hesitated to take the step, because of the poor condition of many of the Indian homes, have been surprised to find out how much some of these homes have improved during the short period that has elapsed since the closing of boarding schools, and with what quick responsibility the Indian parents have resumed the care of their children.

It is evident that the reduction of boarding schools and the increase of day schools is not an innovation but is an established policy, whose success is fully demonstrated. In addition, however, the change does assist toward the emergency economies.

It is expected that during the school term 1933-34, from 4,000 to 5,000 of the 22,000 children formerly attending Federal boarding schools will be in attendance at local day schools or public schools. Nearly 60,000 Indian children will be attending public schools and Federal day schools.

There still remain, however, 12,000 unschooled Indian children for whom school opportunities must be provided in the near future. For the great majority of these we plan to provide day schools.

The development of local home schools is being given great impetus by the building program now planned. Activities needed for the development of rural community and home life will be emphasized in all building programs now under way.

PROGRESS

The outstanding significant feature of this year's program in the development of day and public school facilities in lieu of boarding schools was the program on the Pima and Papago Reservation in southern Arizona. The boarding school at Sacaton, Ariz., was changed to a consolidated junior high school, the first to be established on a day basis. Three consolidated schools were built on the two reservations and numerous small local schools. School facilities are now available at home for the larger group of children living on these two reservations.

The boarding schools at Lac du Flambeau, Wis.; Hoopa Valley, Calif.; and Yuma, Ariz., became day schools. The vocational teachers attached to these schools work with the homes so that an adult program is also carried on. One of the boarding schools on the Cheyenne and Arapaho Reservation in Oklahoma and the boarding school on the Tulalip Reservation in Washington were closed and the pupils placed in public schools. Workers were assigned to see that these children were ready for public school and actually enrolled. Another step forward has been the reduction in enrollments in the larger nonreservation schools. These schools have been overcrowded for years, but with the development of facilities at home it has been possible to abolish the lower grades, thus reducing the attendance. Plans were also made for closing the Anadarko boarding school on the Kiowa Reservation, in Oklahoma, and changing the boarding schools on the Shoshone Reservation, in Wyoming, and Colorado River Reservation, in Arizona, to day schools.

In 1933-34, as a result of the reduction in appropriation made necessary by the economy program, the following schools will be maintained on a skeleton basis: Mount Pleasant Indian School, Mount Pleasant, Mich.; Rapid City Indian School, Rapid City, S.Dak.; Genoa Indian School, Genoa, Nebr.; Hayward Indian School, Hayward, Wis.; and the Theodore Roosevelt School, Fort Apache, Ariz. The boarding school at Chemawa, Oreg., will be reduced to 300 students and will be maintained on a strictly vocational basis.

The closing or diminution of the above schools has resulted in the development of some very interesting local community programs. For instance, the larger part of the enrollment in the Genoa Indian School, Nebr., came from the Winnebago Reservation. The morale among the homes on this reservation is at a low ebb, but through placing these children in schools at home, funds are being released to assist

in building up Indian family and community life. The program in the local high schools is being strengthened and adapted to the needs of the Indians by adding vocational courses formerly given at the Genoa School. A community center will be built up, and definite contacts will be insured between the homes and the schools.

Sharp reductions are in process in a number of the large boarding schools such as Haskell Institute, Lawrence, Kans.; Sherman Institute, Riverside, Calif.; and the Indian schools at Phoenix, Ariz.; Albuquerque, N.Mex.; and Chilocco, Okla. Only students who otherwise would not have school facilities are being enrolled. The superintendents of all the changed schools are being held responsible for a check-up of students excluded from their schools.

THE EXISTING DAY SCHOOLS

In 1932 there were 5,063 children enrolled in day schools, while in 1933 this number had increased to 6,836. With the day school building program now programmed these numbers will be greatly augmented. A large number of children who would otherwise not be enrolled in any school will be brought into school.

In the 5 new 1-room day schools established in the northern and southern Navajo jurisdictions in the past year the ages of the children attending ranged from 6 to 17 years. Out of a total enrollment of 219 in these 5 schools, 193 had never attended any school, while only 4 were in grades as high as the third. The enrollment in two of these schools in northern Navajo—namely, those at Red Rock and Sanostee—grew so rapidly that it was necessary to provide an additional teacher before the end of the school year. This expansion of day schools brings a new challenge to teachers, supervisors, and all others responsible for development of a program that shall serve both the children and the adults of the community. Gradually a school program is taking form that provides learning experiences as related directly to children's environmental background. School activities are based on children's individual needs and capitalize the opportunity for preservation of racial culture and for developing the children's creative abilities. Thus the construction of a new church in a Pueblo community is paralleled by a study of some of the earliest church architecture in the Pueblo country and develops into a study of the great cathedrals of the world; a woman of the Santa Rosa village instructs the day school children in making native Papago pottery; an old man of the village of San Juan had a regular weekly schedule on the day-school program for instructing the children in tribal songs in their native language; children give color-expression in illustrating their simple original compositions which serve as reading materials; some Navajo children give poetic expression to their love for the mesa, the pinto pony and their thoughts about the clouds in the sky,

while the Sioux children's lines regarding early Indian history of South Dakota breathe pride in tribal prowess.

Day-school employees are becoming community conscious and are increasingly capitalizing opportunities for affecting the community through school contacts. All the day-school teachers at Pine Ridge remained on the reservation during the past summer in order to guide the children's garden and other group activities organized before the close of school, thus encouraging the parents, many of whom are summer nomads, to remain at home, and develop family vegetable gardens. Early in the spring one of these men teachers organized a baseball team among the younger men of his community and developed a summer schedule of games with other teams on the reservation, thus inducing these men to remain at home during the crop season, contrary to their habit of abandoning their farms during the summer and returning in fall. Community contacts were in several instances made by sponsoring returned-student clubs. A school-community program and dinner was planned last Thanksgiving Day in one of the new Navajo day schools, the mothers furnishing part of the food and participating in preparation and serving and a group of returned students furnishing part of the musical entertainment. Definite steps, too, have been taken to improve the day school teaching personnel. Instead of continuing the practice of using the day schools as a depository for unsuccessful teachers from other classifications and from boarding schools, definite steps have been taken to clear the day schools of employees who are not rendering a satisfactory day-school service. An opportunity was given boarding school teachers to volunteer for day-school work. Supervisors have been definitely recruiting among successful boarding-school teachers who seemed to have the qualities necessary for the new kind of day-school program in the process of development. Some of the outstanding teachers whose positions were abolished through the closing of boarding schools were transferred to day-school positions. Within the limitations of the civil-service regulations, teachers are very carefully selected for all day-school positions from the standpoint of training, experience, and personality.

Ultimately, and the sooner the better, Indians should be the teachers and the local administrators of the Indian schools. Peculiarly is this true of the Indian day schools. To this end, new and expedited teacher-training of Indians is one of the most pressing challenges facing the Indian Service.

PUBLIC SCHOOLS

During the year 1932-33 applications were received and approved from 1,092 State public-school districts for payment of tuition for 15,650 Indian pupils. These applications and the enrollment total

given were for parts of the Indian country exclusive of the territory of the Five Civilized Tribes, Oklahoma, where a special arrangement prevails in accordance with which tuition was paid for 23,411 pupils. Therefore, for the entire country there was an approximate total enrollment of 39,061 for whom tuition was paid.

Reports from all field units show an actual public-school enrollment for the year of 43,988, which includes the total given above for whom tuition was paid. For the Five Civilized Tribes, a careful estimate was made by the Supervisor of Indian Education for Oklahoma of the number of additional children attending school in towns and cities for whom no tuition was paid, the estimated number being 4,406 children. This number is not included in the total of 43,988. Field reports have also shown an additional number of 8,114 children not included in the above total, concerning whom definite information as to school attendance was not furnished. These children belong to families who have left the home reservations and live chiefly in towns and cities. There is reason to believe that many of them are enrolled in the public schools of the communities in which they reside.

In conferences with State and local public school authorities, representatives of the Indian Office have made clear that the purpose is not to place an added burden upon the States, but rather to pool Federal and State resources with the object of securing a better quality of education for both whites and Indians. State supervisors of Indian education employed by the Federal Government but working closely in touch with State school officials have recently been designated for Arizona, South Dakota, Washington, Wisconsin, Nebraska, and Michigan, in addition to Oklahoma, where we have had a State supervisor of Indian education since 1931. The Arizona State supervisor has been charged with the special responsibility of developing an educational program for the Navajos.

VOCATIONAL TRAINING

Justification for the continuation of the senior boarding schools will mainly depend upon their ability to give specialized and practical vocational training of a type not available to the Indians on the reservation or elsewhere. This training must be such as to enable young Indian men and women to earn a living on or off the reservation as the case may be.

To secure this result, steps have been taken this year to develop a more practical type of training. In the senior high schools considerable improvement and progress has been made in the quality and quantity of practical vocational training given. This is evidenced by the number of students who have secured employment upon graduation, as well as by the undergraduates working during the summer

vacation in the fields of employment for which they are being trained, and this notwithstanding the present economic conditions.

New shop buildings were put in service at Carson Institute, Stewart, Nev., Flandreau, S.Dak., Tahlequah, Okla., Tomah, Wis., and Wahpeton, N.Dak. Chilocco, Okla., Haskell Institute, Kans., and Pierre, S.Dak., have new shop buildings under construction.

The courses of instruction are organized along specialized vocational lines and the general maintenance of the boarding school is utilized to give practical training to the students in the various phases of agriculture and industry.

The industrial training program of the community day schools is being extended to include everyone, from the boys and girls in school to the adults at home. The range of agricultural and industrial training activities at these day schools is planned to supply the needs of the community in which it is situated.

The work for girls in the field of home making is now developed to the extent that home-economics teachers are placed in all day and boarding schools where the community situation in connection with the school and the ages of the girls are sufficient to demand this type of training. Practically all assistant matrons and seamstresses in the Indian Service are girls trained in home economics in Indian schools. The program is now organized so that there is a definite carry-over of the training at school into the homes.

SCHOOL SOCIAL WORK

The curtailment of boarding-school enrollment necessitates a careful selective process in order to reserve the boarding school for four special classes of Indian children—(1) orphans who have no homes at all, (2) neglected children whose home environment is wholly demoralizing, (3) children who have no local school facilities; and (4) high-school pupils desiring special vocational training opportunities not offered by local schools. In order to make this possible social workers have been attached to the boarding-school staffs at Chilocco, Genoa, and Mount Pleasant schools. They have visited the homes of pupils in these schools, arranged for attendance at other schools and have followed these children to see that clothing, food, and textbooks are provided in cases requiring special assistance. In the Kiowa jurisdiction the same kind of work was done for all the children enrolled in the two reservation boarding schools. For all of the other boarding schools, where enrollment was to be radically reduced, similar work was done by either school social workers or day-school representatives. It was originally planned that a complete study of the family situation and local school opportunities, together with the necessary guarantee of follow-up on each child, should be obtained for each boarding school before any considerable

changes were made in enrollments. Diversion funds from boarding-school appropriation, however, have been used to render special aid in cases where parents are unable to provide the clothing necessary to keep their children regularly in school, and to provide lunches and text books.

Five of the 13 school social workers have been assigned to special boarding school enrollment work. The other eight have been working on reservations where day school and public school programs were already in effect. Although they too are responsible for the boarding-school enrollment or the withdrawal from boarding school of children depending on home conditions and school facilities, nevertheless the major part of their work is helping parents and children adjust to changed conditions brought about by the children living at home and attending local schools. In these times of economic stress this adjustment has reduced itself in large measure down to looking after such essentials as food, clothing, and cleanliness.

There has been noted on the part of the Indians a growing sentiment in favor of local education and a decided interest in community activities, especially those promoting the welfare of their children. At Truxton Canon jurisdiction, for example, the social worker, herself an Indian, began with a program of community organization. It is expected that in the future social work will fall into two general lines—(1) a continuance of work with individual children and families, and (2) encouragement and development of group participation in a cooperative community program, providing normal recreational, social outlets, and opportunity for community initiative and self-help. The social worker is but one of a group working directly with the Indian children and their parents in the home in order to help them with their problems of adjustment to the complexities of their changing community life.

JUNIOR PLACEMENT AND GUIDANCE

Modified forms of the "outing" system, which have long been a feature of the Indian work, are continuing in operation at Los Angeles, Oakland, Tuscon, and Kansas City. At Haskell Institute and the Phoenix Indian School, a plan of vocational and educational guidance through staff workers in the schools has been inaugurated and is carried on in connection with that of placement in offices in Kansas City and Phoenix. The work in all of the placement and outing centers has been more closely coordinated with that of the local social and civic agencies of the various communities in which they operate. It is planned that within another year the Indian outing work at Oakland will be practically integrated with the local agencies which provide such services to white citizens.

HIGHER EDUCATION

As part of the effort to get away from segregated institutional care for Indians, an increasing number of opportunities for vocational and higher education in established State and local institutions have been set up. As many as 600 Indian youth are attending colleges and universities, of whom 161 are being assisted through Federal or tribal loans and other Government aids. Arrangements have been made to pay the instructional costs of qualified Indian youth at publicly supported institutions and colleges. This is considered more desirable than maintaining a separate university or college for Indians, since it has been demonstrated that Indian youth can successfully utilize the same higher educational institutions as any other group.

INDIAN PERSONNEL

In June of this year there were over 20 Indian young people being graduated from colleges, who wished employment in the Indian Service. Several of the young men have been placed as boys' advisers, teachers in shops, junior and senior high schools; a number of the college-trained Indian women have accepted positions as housekeepers or assistant teachers; others have gone into emergency conservation work camps until such time as they can qualify for positions in their own special fields through civil service examinations. In order that first consideration may be given to qualified Indians who have taken civil service examinations, arrangements have been made with the Commission to provide a special certificate of eligibles who are at least one fourth Indian.

As a part of the effort to continue to recognize ability, training, and initiative in Indians, a number of appointments of Indians to responsible educational positions have been made—Henry Roe Cloud, Winnebago, to the superintendency of Haskell Institute, Kansas; Robert C. Starr, Cheyenne, dean of men in the same school; Kate Wagon Smith, Delaware, school social worker for the Truxton Canon and Colorado River jurisdictions, Arizona; Verna Nori, Pueblo, graduate of Mount Holyoke College, day-school teacher at Santo Domingo Pueblo, N.Mex.; Charles Heacock, Sioux, science teacher in the first reservation high school, Pine Ridge, S.Dak.; Mylie Lawyer, Nez Perce, and Christine Garcia, Papago, home economics teachers at Warm Springs, Oreg., and Pima, Ariz., respectively. Ruth Muskrat Bronson, Cherokee, continues to act as educational counselor and to administer the various educational loan aids.

ALASKA

During the fiscal year the Director of Education for Alaska visited each of the 101 local day schools and the 3 boarding schools.

As a result of information gained on these extended tours and the contacts made with the personnel in the schools and with Territorial school officials and other interested persons, an improved curriculum more adapted to the social and economic needs of the natives is being put into effect. As a preliminary step specific qualifications in the way of education and experience have been set up for the appointment of teachers in Alaskan schools and several changes in personnel have already been made. A supervisor of elementary education with experience in the Indian schools of the West has been transferred to Alaska and is at present making a study of the schools in the southeastern district. As soon as additional funds are available it is hoped to appoint other supervisory officials in special fields such as home economics and agricultural extension.

Due to the reduction in funds it was necessary during the year to change 11 local day schools from 2-teacher schools to 1-teacher schools. The school at Russian Mission on the lower Yukon River was closed due to the small enrollment. The orphanage at Tanana was closed at the end of the year in line with the policy of the Indian Office to provide education for the native in his own community. A number of school children were returned to their homes; others were placed with private native families, and others were transferred to the boarding school at Eklutna on the Alaska Railroad pending placement in private native homes. The 12 blind children at Tanana have been transferred to the Eklutna school, together with their special instructor and matron.

Opportunities for higher education and advanced special training hitherto available to Indians in the States have been extended to Alaska. The following brief statement shows that a total of 16 Alaskan natives are at present being assisted. All of these are beyond high school grades.

Tuition payments from the fund available for higher education (this is not reimbursable, but a gratuity)-----	6
Educational loans (reimbursable)-----	9
Working scholarship, providing room and board in return for some work-----	1
Total-----	<u>16</u>

HEALTH

Notwithstanding a steadily increasing volume of patient activities, the medical division has had to carry on in the year ending June 30, 1933, with a stationary personnel and stationary or even decreased operating funds. Anticipating reduced funds for the various health activities, the district medical directors were instructed early in the year to devote special attention to the working out in their jurisdictions of improved medical and hospital procedures without increase of existing facilities or enlargement of personnel.

The cooperative activities with other Federal State, county, and local official health agencies, carried on now for several years, have had an excellent effect on the whole of the Indian Service Health Division and have been reflected in increased participation by Indians in matters of disease prevention and physical wellbeing.

The Committee on Indian Affairs of the State and Provincial Health Authorities of North America is continuing its active participation toward the further development of effective health cooperation between the personnel of the Indian field service and those of the various States where Indian groups are included in the State population. This relates especially to the more accurate collection and reporting of vital statistics and of morbidity data, and to the application of various procedures for disease prevention and control. The United States Public Health Service has continued the detail of personnel to the Indian Service, and has made available to a constantly increasing degree the services of various types of health personnel, including medical officers, field directors, sanitary engineers, personnel and facilities of the National Institute of Health, in relation to epidemic disease control, the safeguarding of water supplies, sewage disposal, milk production, the control of venereal disease, and general public health measures.

Laboratories of the State health departments are in many instances performing various types of examinations necessary in the program of medical relief and control of infectious diseases.

Tuberculosis, epidemic outbreaks of infectious diseases, diseases of infancy and childhood, trachoma, etc., continue to demand the attention of all health personnel in view of their outstanding importance in the Indian field. General hospitals of the Indian Service are being made available to an increasing degree for the diagnosis, care, and treatment of tuberculosis, with special emphasis on the reception and segregation of this disease pending necessary and suitable arrangements for transfer for sanatorium care and treatment.

Special emphasis through the activities of the field or public health nurses is being given to maternal and infancy welfare, preschool and school child health, vaccination and inoculation against transmissible disease conditions, the location of tuberculosis in homes and the transfer of such cases to appropriate hospital and sanatorium treatment or supervision where hospitalization is ineffectual.

The number of live births in Indian Service hospitals continues to show material increase from year to year. The following tabulation shows the number of live births in Indian Service hospitals in the years 1928-33, inclusive:

Live births:

1928-----	595	1931-----	1,360
1929-----	816	1932-----	1,888
1930-----	1,099	1933-----	2,277

Live births—Continued.

The number of examinations for trachoma made by special physicians (not including examinations by agency and school physicians) was approximately 61,426. Of this number, 6,064, or 9.9 percent, were given a positive diagnosis. The number of surgical operations performed during the year for the relief of trachoma totaled 2,599. The number of treatments other than surgical totaled 3,333. These activities were carried forward by special physicians, notwithstanding the broadening scope of their work to include various types of surgery not relating to diseases of the eye and the necessary interruption of their special details to serve in agency hospital or sanatorium positions during emergencies.

For the contagious and infectious diseases reported during the year, the following data are submitted.

Chicken pox, 865, or 222 less than in 1932.
Diphtheria, 92, or 37 more than in 1932.
Dysentery, 655 (figures for 1932 not available).
Erysipelas, 100, or 35 more than in 1932.
Impetigo, 5,061, or 1,118 more than in 1932.
Influenza, 23,931, or 9,168 more than in 1932.
Malaria, 379 (figures for 1932 not available).
Measles, 2,665, or 1,914 more than in 1932.
Meningitis epidemic, 79, or 44 more than in 1932.
Mumps, 810, or 481 more than in 1932.
Poliomyelitis, 19, or 8 more than in 1932.
Scabies, 3,291, or 1,205 more than in 1932.
Scarlet fever, 50, or 44 less than in 1932.
Septicemia, 61 (figures for 1932 not available).
Smallpox, 31, or 16 less than in 1932.
Tinea, 338 (figures for 1932 not available).
Trachoma, 7,702, or 942 more than in 1932.
Tuberculosis, all forms, 4,465, or 111 more than in 1932.
Typhoid or paratyphoid, 131, or 85 less than in 1932.
Veneral diseases, 2,783, or 124 more than in 1932.
Vincent's angina, 191, or 70 more than in 1932.
Whooping cough, 898, or 36 less than in 1932.

The vaccinations and inoculations performed during the year and reported to the Office from the various jurisdictions was 27,844, as follows:

Smallpox-----	8,822
Typhoid-----	6,801
Diphtheria-----	10,952
Other vaccinations and inoculations-----	1,269

The vaccinations and inoculations for the past 5 years were as follows:

	1929	1930	1931	1932	1933
Total reported.....	25,790	32,286	30,764	37,022	27,844
Vaccinations against smallpox.....	12,966	12,233	11,312	9,955	8,822
Inoculations against typhoid.....	2,686	7,094	6,106	10,610	6,801
Immunizations against diphtheria.....	7,933	10,085	12,675	14,475	10,952
Other (not reported separately):					
Pertussis, Rocky Mountain fever, etc.....	2,205	2,874			
Pertussis.....			198	477	332
Rocky Mountain fever.....			283	607	433
Other.....			190	898	504

The San Xavier Sanatorium, 35 beds, was completed and opened for patients on May 2, 1933. The Pipestone Hospital, with 36 beds, was opened on September 1, 1932. Owing to impoundment of funds for equipment for the Omaha and Winnebago Hospital and the lack of sufficient funds in the appropriation for operation to purchase the required equipment, the new building is not yet open for patients. It is proposed to utilize the usable equipment in the old hospital and put the new facilities into operation as far as practicable. The Clinton Hospital of 30 beds did not open during the fiscal year 1933 owing to delays and difficulties in obtaining water and sewer connections. It was opened October 1, 1933. The Tomah Hospital of 41 beds was opened on June 15, 1933. The Edward T. Taylor Hospital at Ignacio, Colo., with 35 beds, was opened on January 22, 1933. The Hopi-Navajo Santorium for tuberculosis will be opened in the fall of 1933.

Construction work on the Albuquerque Sanatorium is proceeding apace under contract which calls for completion by January 15, 1934. Reports indicate that it will be completed prior to that date. The construction of the Sioux Sanatorium at Pierre, S.Dak., is being held in abeyance due to impounding of funds.

A number of States have manifested strong interest in increasing the hospital and sanatorium facilities of State, county, and municipal institutions in order that Indians may be admitted and treated therein. Minnesota has shown material interest in enlarging the facilities of the State Sanatorium at Ah-Gwah-Ching in order that these measures may be brought about. Certain of the county sanatoria in California have also shown evidences of an identical interest. It is believed that to add—at Federal expense if need be—to the facilities of such established institutions, controlled and operated by the States or by groups of counties, would make available to Indians care and treatment at a reasonable cost and under conditions where a comprehensive and satisfactory professional service could be afforded.

Physical improvement in existing Indian Service hospitals and sanatoria has been brought about to a limited extent only in the past year. This relates both to rearrangements of institutional space and to additions to and improvement in diagnostic and treatment equipment.

This report should not be closed without a statement relating to the increasing demands made upon the health personnel in the hospital institutions in the face of decreasing appropriations for the operation of all Indian health activities. The tabulation below will show from 1929 to 1933, inclusive, the beds available, the number of patients treated, the total number of hospital days, and the percentage of utilization of hospital beds.

	Beds	Total patients	Total hospital days	Percent-age of utilization
1929.....	3,162	37,511	677,241	59.5
1930.....	3,749	38,536	768,160	56.9
1931.....	3,865	40,189	869,625	62.5
1932.....	4,048	45,086	1,003,311	68.8
1933.....	4,164	50,376	1,077,948	72.4

There is a further table showing the appropriations from 1929 to 1934. These tabulations indicate the peak year as far as appropriations are concerned in 1932; a decreasing appropriation for 1934.

Year	For hospitals	General purposes	New construction	Total
1929.....	\$966,000	\$319,000	\$155,000	\$1,440,000
1930.....	1,520,100	623,500	450,000	2,593,600
Deficiency act.....	500	134,500	265,000	400,000
1931.....	2,008,000	758,000	372,000	3,138,000
Deficiency act.....	38,000	-----	250,000	288,000
1932.....	2,282,000	943,000	825,000	4,050,000
Deficiency act.....	27,500	-----	150,000	177,500
1933.....	2,396,000	817,000	-----	3,213,000
1934.....	2,251,600	744,600	-----	1,2,996,200

¹ \$257,400 to remain unexpended for purposes of economy, which includes \$28,600 for Laguna and \$33,100 for Pyramid Lake Sanatorium, which were abandoned. The remainder is principally from hospital operation costs. This does not include 6½ percent of savings to be made by reason of salary reductions.

Reference to the table above will show a constant increase in the number of patients admitted to hospital care and treatment and in the number of hospital days. For example, slightly over 45,000 patients were admitted to Indian hospitals in 1932 and more than 50,000 were admitted in 1933. The number of hospital days in 1932 totaled slightly over 1,000,000, and in 1933 more than 1,077,000. If the major proportion of Indian Service hospitals are to remain understaffed in all departments, and without opportunity to increase personnel to meet the increasing number of patients seeking hospital care and treatment, inevitably there must follow either a curtailment

of patient activities and an actual refusal to admit more than a certain number of Indians to hospital care and attention during a given period of time, or a deterioration in the character and quality of services. Ultimately equaling, or exceeding in importance, the hospital and clinical service to Indians, would be a more all-embracing and more intensive health-education service. Upon such provision the effective control of tuberculosis and of child mortality will ultimately depend upon health education, and the interrelated gains of more and better food and better housing and sanitation. But while recognizing this fact, and hoping to meet its challenge in the years ahead, still we point out that the clinical provision to Indians remains vastly, tragically insufficient.

ALASKAN HEALTH SERVICE

The Alaska Medical Service of the Office of Indian Affairs is conducted for the benefit of the 29,983 Indians and Eskimos inhabiting Alaska. This service is under the general direction of the Director of Health of the Indian Service at Washington, D.C., and under the immediate supervision of Dr. Frank S. Fellows, Medical Director for Alaska, with headquarters at Juneau, Alaska. Both directors are officers of the United States Public Health Service, and the medical work among the natives is conducted in cooperation with that Service.

Mention should also be made of and credit given to the United States Coast Guard, whose officers, physicians, and dentists in Alaska have extended their facilities most cordially to the Indian Service and have themselves rendered valuable medical and dental assistance to the natives at villages reached by the Coast Guard vessels.

The personnel of the Alaska Medical Service under the director consists of 6 full-time physicians, 5 part-time physicians, 1 traveling dentist, 15 hospital nurses, 23 public-health village nurses, and 32 minor employees, including hospital attendants, orderlies, janitors, cooks, etc., making a total of 82 medical employees.

Seven hospitals are maintained as follows:

1. At Akiak, on the Kuskokwim River, with 9 beds.
2. At Juneau, in southeastern Alaska, with 24 beds in the general hospital and 30 additional beds for tubercular patients in the hospital annex building.
3. At Kanakanak, on Bristol Bay in western Alaska, with 15 beds in what were formerly boarding-school buildings, the hospital building having been destroyed by fire.
4. At Kotzebue, in northwestern Alaska, with 20 beds.
5. At Mountain Village, on the Lower Yukon River, with 18 beds.
6. At Tanana, on the Upper Yukon River, to care for Indians in the interior of Alaska, with 22 beds.
7. At Unalaska, on the Aleutian Islands, a small infirmary with 6 beds and a physician in charge.

Small hospitals of 6 beds each, at which no physician is stationed but with a nurse in charge, are maintained at Chitina and Yakutat. During the year a new hospital building with a capacity of 20 beds was constructed at Unalaska. It was put into operation October 1, 1933.

Medical treatment is also furnished Alaskan natives by the following hospitals:

1. Maynard-Columbus Hospital at Nome (a Methodist institution).
2. The Alaska Railroad Hospital at Anchorage.
3. The Children's Orthopedic Hospital, Seattle, Wash.
4. Tacoma Indian Hospital, Tacoma, Wash.
5. Morningside Hospital, Portland, Oreg.

A medical boat with a physician and nurse aboard was operated on the Yukon River during the summer of 1932. Due to decreased appropriations, it was necessary to discontinue the operation of this boat during the summer of 1933.

It also became necessary to close the hospital at Akiak because of lack of funds for its operation. A traveling physician has been appointed to render medical service to the natives of this region.

An effort was put forth during the year to raise the caliber of employees in the Alaska Medical Service. A survey was made of the personnel and there have been a number of changes during the year. Higher qualifications have been set up for physicians and nurses, which applicants must meet before they can secure appointment.

A beginning has been made in the policy of changing the village-public-health nurses, serving one village only, to traveling nurses, each serving a number of villages.

Dr. Fellows continued to make frequent tours of inspection and investigation throughout the Territory to direct the medical work and to instruct the employees under his supervision. He has been making a thorough study of health conditions among the natives throughout Alaska.

Tuberculosis continues to be the most prevalent disease among the natives and the facilities for the prevention, care, and treatment of this disease among them are most inadequate. The Alaska Territorial Legislature and the American Legion passed resolutions urging increased appropriations to the Indian Service for combating this disease.

There is need for the construction and operation of at least 1 hospital in each of the 4 judicial divisions, solely for the care and treatment of tuberculous native patients.

The hospital building at Kanakanak, which was destroyed by fire, should be rebuilt. A new medical building is also urgently needed at our boarding school at White Mountain in northwestern Alaska.

Due to the economy program, we are not requesting appropriations for this construction in our estimates for 1935, but the need should be kept in mind. There is also great need for additional traveling public-health nurses to instruct the natives in the prevention of disease, and in follow-up work on cases discharged from hospitals, in addition to the usual treatment of the sick and instruction in the care and feeding of infants and children, adoption of sanitary measures, etc.

Additional public-health nurses would afford greater protection to the Alaskan natives through preventive measures such as vaccination against smallpox and immunization against contagious and infectious diseases.

Concerning whole populations of natives in Alaska, it can be said: A modern health service must be furnished them if they are to survive. Only a beginning as yet has been made.

FORESTRY

The depressed lumber market of 1932 continued on into the fiscal year 1933 and practically stopped all timber sale activities on the Indian reservations. In the spring of 1933 the lumber market showed some improvement, and a feeling of hopeful anticipation was felt throughout the industry. Sales at the Menominee and Red Lake mills increased perceptibly, and the Cady Lumber Corporation at McNary made plans to commence logging on the Fort Apache Indian Reservation sometime during the summer of 1933. Logging operations on the Klamath Indian Reservation had practically come to a standstill, the lumbermen maintaining that the high stumpage rates obtained for the Klamath timber prevented them from carrying on any logging activities on the reservation. On March 4, 1933, public act no. 435 (72d Cong.) was passed. This act made possible a reduction of stumpage rates which, however, could only become effective if the Indians consented to a modification of their timber contracts. During the past summer a special committee of 15 Klamath Indians drew up a tentative, modified contract for approval by the Secretary of the Interior and the lumbermen. If this contract, or something resembling it, is agreed upon by all parties concerned, there should be a great stimulation of the timber business on the Klamath Reservation.

The Klamath Indian Reservation, which for many years has featured prominently in the fight against the pine beetle, reported that due to the severe winter weather a large percentage of the pine-beetle brood had been killed. Consequently, control operations were not considered necessary in the spring of 1933. However, it is important that we do not become too optimistic, for beetle attacks have waned many times in the past only to return with increased severity when

weather favorable to beetle development returned. Epidemic conditions also prevail on the Warm Springs and Yakima Reservations. On the former it is hoped that Indian-conducted logging operations will largely eliminate the infected trees. On the latter the infected stands are so remote that the cost of control measures would be almost prohibitive.

The fire situation in the fall of 1932 was less severe than during the early part of the season. However, fires in the early part of 1933 again forcibly brought to our attention the inadequacy of the forestry personnel. Before satisfactory results can be obtained in the suppression of forest fires it is imperative to build up an organization which will make it possible to meet conditions. It is misguided economy not to provide funds adequately to man our fire organization, for a single bad fire year has often caused damage many times greater than the cost of adequate protection for 20 years and has made impossible the organization of a self-sustaining forestry operations among the Indians.

A substantial allotment for road work on Indian Reservations was received during this fiscal year, and many of the roads so greatly needed on the Indian Reservations were constructed. The need to enlarge the road construction personnel in order to make the best use of the available funds made it necessary to use many of the timber and grazing men for road building. Consequently, as road building was one of the major projects of the year on many reservations, it generally required the full time of the forestry men to the exclusion of all other necessary forestry activities. The fact that timber operations were practically nil greatly aided in enabling us to do the road work without materially increasing the overhead. Many additional roads are needed on various Indian Reservations to help in making the day-school project a success. Proper recognition must be made of the fact that sufficient maintenance funds must be supplied in order to safeguard the initial investment in road construction.

The study of grazing conditions and methods to improve the ranges of the Indian Reservations has been carried on with the small force available for the purpose. However, it was not possible to give this very important phase of forestry adequate attention, due to our limited personnel.

One of the most serious problems confronting the Indian Service is that of range management and erosion control. Thousands of Indians are directly dependent upon the ranges for their livelihood, and therefore range management and erosion control constitute one of the primary problems to be solved in the attempt to bring about more satisfactory living conditions and living standards for the Indians. Our studies to date have indicated the great need for a grazing reconnaissance upon which to base a plan of range management which will

improve the present range conditions, place the Indian livestock industry upon a permanent basis, and avert the costly erosion-control activities which would never be necessary with controlled grazing.

In the latter part of the spring 1933, the emergency conservation work camps were started among the Indians. From the nature of the work authorized by the President under the Emergency Conservation Act, practically all of our foresters were employed as project managers and assistants to superintendents in laying out the work on the various reservations. Forest improvements which had been planned for years, but for which funds had not been available, were suddenly made possible. From results obtained so far the benefits of the emergency conservation works work have not only been material, but have had a desirable influence upon the Indians themselves. Many Indians are becoming much interested in the natural resources on their reservations and a large number of excellent foremen are being developed in the emergency conservation work camps. For years it has been clear that forestry, with all its various activities, such as grazing, road and trail building, telephone line construction, lumbering, and fire protection, provided an ideal occupation for the Indian youth. It is believed that with the emergency conservation work an impetus has been given this thought and great hopes are entertained for teaching and training the Indians along many forestry lines.

IRRIGATION

The Indian irrigation service is moving in the direction of—

- (1) Cancelation of unjust and uncollectible reimbursable indebtedness on Indian irrigated lands;
- (2) The decentralization of responsibility for the maintenance of Indian irrigation—increased responsibility therefor to be vested in local superintendents and in the Indians themselves;
- (3) The readjustment of construction programs, to the end that irrigable lands shall likewise be irrigated and cultivated lands.

The wellnigh insurmountable handicaps on the use by Indians, and the permanent retention by Indians of allotted irrigated lands, still wait to be overcome, as does the handicap imposed by the absence of a system of financial credit for Indian irrigationists.

Activities of the Irrigation Division of the Indian Service are primarily concerned with locating, investigating, and developing a supply of water for the irrigation of such of the Indian lands in the arid and semiarid regions as are economically susceptible of successful cultivation by the artificial application of water and also the development of domestic and stock water by the installation of various types of wells, pumping plants, charcos, small reservoirs, and concrete tanks. Supplementary to its primary functions the Division is charged with the responsibility of protecting school and agency property from

floods, the installation of adequate drainage systems where necessary for lands under the irrigation projects or where necessitated solely by seepage waters rendering otherwise arable areas unfit for successful cultivation, and the supervision and inspection of general irrigation engineering and drainage work when performed under contract with private companies, municipalities, or State political subdivisions.

The legal staff of the Division is responsible for the protection of the water rights of the Indians and the rendering of counsel and advice on the many points of law arising in connection with the above-described activities.

During the past year ordinary operation and maintenance work was performed on the 10 major and numerous minor projects directly under the supervision of or operated by the Service. Routine maintenance consisted of the cleaning and enlarging of hundreds of miles of canal, replacement of numerous dilapidated timber structures with new ones either of concrete or newly milled timber; the installation of metal flumes where needed, and in general the replacement of small dams and other parts of the systems, where funds were available.

Construction activities as a whole were largely curtailed either by reason of lack of funds or the general cessation of such work by the Government prior to initiation of the public-works program.

Surveys and investigations of new and additional reservoir sites with a view to securing a more adequate water supply for a number of the projects were undertaken and a soil expert of the Bureau of Chemistry and Soils, Department of Agriculture, was engaged in classifying the soils of various projects for the purpose of eliminating marginal and other areas not susceptible of beneficial cultivation.

The prevailing low prices for farm products, and other economic factors having a depressing effect on agricultural operations, were instrumental in reducing the irrigated areas as well as the crop returns on the projects.

On the Wapato project, with approximately 100,000 acres under constructed canals of an estimated total of 125,000 acres irrigable, the crop yields were generally good, but the low prices reduced net income to an extremely low figure. Nine miles of transmission line were constructed and the Drop No. 3 generating plant completed.

Surveys at the Flathead project reveal an additional water supply of 50,000 acre-feet urgently needed to insure adequate water for the irrigated lands. The power system operated for the benefit of the project served an average of 1,250 customers. One new reservoir with a maximum capacity of 10,300 acre-feet of water available for the Moiese Valley has been completed with labor furnished by the landowners as an offset against their irrigation charges and the enlargement of an existing reservoir to increase storage capacity from 13,000 acre-feet to 26,000 has been practically completed.

On the San Carlos project very little construction work was undertaken, but during the year an intensive program of canal cleaning was undertaken. Data on the available storage at the Coolidge Dam showed a loss of 161,557 acre-feet for the year. Development of power resulted in a net profit of approximately \$8,000 although, due to prevailing unsatisfactory conditions in the copper industry, the project's one important customer was forced to cancel its contract for power leaving as potential customers numerous small consumers at and near San Carlos as well as the agency itself. Considerable correspondence and numerous conferences between Government counsel and representatives of the other parties to the Gila River adjudication suit culminated in an agreement to the entering of a consent decree by stipulation of the parties. The stipulation at the close of the year lacked the signatures of certain necessary parties which, it is hoped, will soon be obtained thus permitting drafting the proposed consent decree in final form.

Navajo and Hopi water supply activities included the maintenance of existing units and the development of 59 new ones including 4 concrete storage tanks, 12 troughs, and 3 small reservoirs. The total number of units at the end of the year was 785, comprised principally of the various types of wells with or without windmills, 334 springs, the remainder being made up of 90 reservoirs, 32 troughs, and 4 concrete storage tanks.

EXTENSION AND INDUSTRY

Through the work of this division the economic status of the Indians is being improved. Special emphasis has been placed upon developing their individual initiative, thrift, and industry. The extension program for each reservation, wherever possible, has been worked out in cooperation with the Indians through their organizations. The response up to date has been very encouraging, and is a demonstration that Indians can be interested in a constructive program.

Inasmuch as it is necessary to use the calendar year in connection with agricultural statistics, the figures given herein are for the calendar year 1932.

During the past year 558 Indian communities have assisted in working out their agricultural and home programs. Reports showed 605 community organizations with a membership of 24,162. Outstanding among these organizations were the farm chapters and women's auxiliaries. The work has been programmed on a project basis with definite goals of accomplishment set up for each project. The project is an outline of some particular piece of work, showing not only the goals to be reached, but the reasons for undertaking such work and the methods of procedure to be used in doing it. Included

in the project outline is a calendar showing what work is to be done, when and where it is to be done, and who is to do it.

There are 110 administrative units to be served by this Division, made up of 213 reservations scattered through 26 States. The Indian populations of the respective reservations vary in number from a few hundred on the smaller jurisdictions to several thousand on the larger. Each reservation has its own special problems. The different stages of advancement of the Indians vary greatly, making the formulation of suitable programs for the different jurisdictions somewhat difficult. It is quite generally conceded by those in a position to know, that because of the intensive campaign waged on each reservation throughout the year by the superintendents and their extension staffs for an increased production in food products, the Indians entered last winter with a more adequate food supply than they have had in many years.

The garden project, because of its importance in providing an adequate food supply, has received more attention than any other. From 63 jurisdictions reporting it is shown that 22,832 families grew gardens with a total acreage of 22,961. The benefits of the extension program are more clearly set forth in comparative figures from 47 reservations. During last year these jurisdictions reported 15,627 families with 13,552 acres of garden, or an average of 0.86 acre per garden. This year these same reservations reported 3,304 more families raising gardens with a total of 20,550 acres, or an average of 1.08 acres per garden. Each extension employee on these jurisdictions was responsible for an average of over 18 new gardens.

Extension employees made 158,938 personal farm and home visits, held 7,468 meetings with a total attendance of 232,877, and received 256,449 office, 49,417 telephone calls from Indians for information and assistance. Method and result demonstrations conducted in teaching the Indians better farm and home practices numbered 3,641 with an attendance of 50,477. Assistance was rendered 3,081 Indian farmers in securing 28,300 head of better livestock. Farm and home building was stressed, resulting in the construction of 4,693 houses, barns, and outbuildings at a value of \$766,264, and remodeling 2,137 others with a resulting increased value of \$193,961. Fairs, short courses, and picnics were held, totaling 1,235 in number.

4-H CLUB WORK

The total club enrollment was 3,336, consisting of 331 clubs which enrolled 1,492 boys and 1,844 girls. A much higher grade of work was carried on than was evident last year. Efforts were devoted to having the boys and girls complete their work rather than merely endeavor to work up a large enrollment. It is estimated that there are over 40,000 Indian children of club age, showing clearly how this

work could be expanded were funds available for the employment of the necessary workers. Gardening, the most important project, enrolled 931, corn 239, potato 237, poultry 367, swine 223, canning 216, sewing 437, clothing 404, handicrafts 145, and home demonstration work 112. The balance were enrolled in miscellaneous smaller clubs.

The 4-H Club work affords an invaluable medium through which to teach the older Indians improved practices, by seeing their children actually practice them.

HOME EXTENSION WORK

This work was carried on along practically the same lines as last year. Inasmuch as the Indian women do a large share of the gardening for Indian families, the home extension agents assisted materially in this work and are responsible for much of the increase noted. On jurisdictions having such workers, gardens averaged 1.64 acres in size compared with 1.08 acres for the service as a whole, and the number of families on these jurisdictions increased from 2,942 last year to 3,711 this year.

On these jurisdictions 242 dwellings were constructed, or an average of 30 per reservation. The average for the entire service was 16. Poultry houses, totaling 114 were constructed or 14 per reservation, compared with a service average of 9; 121 toilets were built, or an average of 17 per reservation, against a service average of 7; 198 root cellars were built, or an average of 27 per reservation, against a service average of 14. Four special projects were carried in cooperation with the General Federation of Women's Clubs with satisfactory results.

Canning work was stressed with the result that 354,543 quarts of vegetables, fruits, and meats were stored for winter, as well as 803,678 pounds of dried products. A total of 23,057 articles were made with a total value of \$32,000, and 649 pieces of home-made furniture were constructed. Nutrition work received attention with the result that 1,649 homes adopted improved practices, and 500 homes adopted better practices in caring for their children. Assistance was given the Indians in disposing of their arts and crafts products, and incomplete returns show more than \$350,000 received from such sales.

DAIRY HERDS

Seventy-one dairy herds comprised of 1,816 cows were operated during the year, having as their principal objective an adequate supply of clean milk for the children in the schools and the patients in hospitals and sanatoria. Records of production were carefully kept, which show considerable progress as a result of the modern, scientific practices advocated by this division. During the year 15,167,480 pounds of milk were produced compared with 13,786,355 last year. The average production per cow was 8,353 pounds compared with

8,021 pounds last year. The milk was valued at an average price of \$3.07 per hundredweight, and the increase of 602,466 pounds over the production of last year of the same number of cows was valued at \$18,495.70, clearly demonstrating the value of the practices in force. The total product was valued at \$465,872.13. The total cost of feed was \$117,676.11. The product was consequently valued at \$348,196.02 in excess of the cost of feed.

Properly trained dairymen cared for the feeding, breeding, and production problems of the dairies. The quality of milk produced was in most instances superior to that which could be purchased locally, the aim being to produce milk equal or of higher quality than commercial grade A. A goal of 1 quart of milk per child per day was set, and in most instances was reached.

AGRICULTURAL LEASING AND REIMBURSABLE FUNDS

About 2,700,000 acres of Indian farm lands are under lease to approximately 27,000 tenants. The difficulty experienced during the past few years in collecting rentals has not lessened. Lessees have been faced with drought, crop pests, and depressed prices, which have been used as justifications to ask for modifications, extensions, and in many cases cancellations. The Indian owners of the land have not failed in a willingness to meet the situation; in fact, in many instances it has been necessary to protect them from lessees who would take advantage of them in this respect by negotiating modifications not warranted by the facts. The Department of Justice is cooperating in the recovery of delinquent rentals. Through the efforts of United States attorneys suits are instituted and judgments rendered by Federal courts.

The complications arising out of attempts to collect money rentals are leading to a much larger percentage of crop share leases. This method has the advantage of interesting the Indian lessor in the methods of farming followed by his lessee, and in seeing that the crop is properly divided in accordance with the terms of the lease. The educational value of this experience is apparent, and leads to a desire on the part of the Indian owner to operate his own place.

Full cooperation is being given the Agricultural Adjustment Administration in the campaign to adjust production in cotton and wheat. In this, as in all matters where the Indian is appealed to for a helping hand, he is not found wanting.

The reimbursable funds continue to be of great benefit to the Indians, taking the place, as they do, of the various and sundry forms of credit available to non-Indian citizens which are not available to the Indians whose real property and in many instances his chattels, are under trust to the Government and therefore not considered an adequate credit basis.

The appropriation for the fiscal year 1933 provided \$475,000 for this purpose. This amount, however, included an item of \$150,000 for the subjugation of raw land on the Pima Reservation and \$50,000 for the purchase of sheep for the Jicarilla Indians who suffered a depletion of more than 50 percent of their flocks because of severe storm conditions. This left only \$275,000 for direct use for the usual industrial credit purposes, which was supplemented by certain tribal revolving funds. We now have approximately 53,500 active reimbursable agreements, the total obligations aggregating more than \$3,000,000.

LAND

NAVAJO LANDS

In the vast domain of the Navajo country in Arizona, New Mexico, Colorado, and Utah, where a steadily increasing population demands more land, the picture has been brightened by substantial additions during the past year; and the beginning of Indian emergency conservation work has made possible a real beginning in the critical task of erosion control, with implied range control, throughout the Navajo country.

Under authority contained in the act of May 29, 1928, and subsequent appropriation acts, there have been purchased a total of 307,-464.97 acres for the Navajo Indians at a total cost of \$513,034.96. These purchases were made from tribal funds, excepting for 54,373.55 acres which were purchased from a reimbursable appropriation of \$100,000 carried in the act of February 14, 1931. In addition to the lands purchased, tribal funds have paid for the lease of 692,640.41 acres of privately owned land at a total of \$20,801.25.

After a struggle of several years' duration, Congress, by the act of March 1, 1933, returned to the Navajo Reservation a tract of land commonly known as the "Paiute Strip" and added a smaller tract known as the "Montezuma Creek Area." These lands lie in southeastern Utah and comprise approximately 554,000 acres. Legislation was introduced during the past session of Congress to extend the Navajo boundary lines in New Mexico and Arizona. The lines proposed merely to "cover into" the reservation lands which the Navajo Indians have been using for generations; especially is this true in New Mexico, where the proposed boundaries would embrace about 4,000 individual Indian allotments on the public domain together with certain areas purchased for the Indians with their own tribal funds and lands exchanged for the Indians with the Santa Fe Railroad Co.

Under the act of March 3, 1921, exchanges of land with the Santa Fe Railroad have been effected. This work has progressed so far that final exchanges will be made in the near future. A total of

approximately 234,000 acres will ultimately have been exchanged for the Indians.

ALLOTMENTS

Allotments of land in severalty were made to 1,216 individual Indians during the fiscal year 1933 on various reservations, aggregating 152,486.33 acres, as follows:

Reservation	Number of allot- ments	Acreage
Cheyenne River, S.Dak.....	112	17,884.83
Crow, Mont.....	129	20,640.00
Fort Peck, Mont.....	153	48,680.00
Fort Yuma, Calif.....	1	10.00
Kalispell, Wash.....	17	710.66
Quinaleit, Wash.....	801	64,080.84
Standing Rock, S.Dak.....	3	480.00
Total.....	1,216	152,486.33

In addition to these reservation allotments, 24 allotments, embracing a total of 1,970.31 acres were made to Indians residing on the public domain.

The work of making exchanges of allotments on the Gila River Reservation, Ariz., in order to provide each allottee 10 acres of irrigable land, has been continued during the year, and approximately 500 of such exchanges have been completed.

MISCELLANEOUS PURCHASES AND ADDITIONS DURING FISCAL YEAR 1933

Purchases have been made by authority of the act of June 7, 1924, for additions to the Indian pueblos of New Mexico as follows:

	Area	Cost
	Acres	
Nambe Pueblo.....	1.036	\$503.00
San Felipe Pueblo.....	3.159	261.92

Several other purchases are being considered.

The purchase of the Barona Ranch property in San Diego County, Calif., for the Indians of the Capitan Grande Mission Reservation, has been completed. This purchase embraces a total of approximately 5,000 acres at a cost of \$75,000; and will furnish homes and agricultural and grazing lands for the permanent location of between 50 and 60 Indians. Modern homes have been built of concrete block construction, with running water, baths, and adequate sanitary arrangements, and have been furnished comfortably with necessary furniture. Additional purchases for other Indians of this band are under consideration.

Under authority contained in the act of May 4, 1931, 640 acres of land were purchased at a cost of \$2,560, as an addition to the Cahuilla Mission Reservation in California.

Under authority contained in the act of June 6, 1932, part of the Rapid City School Reserve, Rapid City, S.Dak., was exchanged for part of the adjoining Pennington County Poor Farm property.

Approximately 630 acres of privately owned land within the Fort Apache Indian Reservation, Ariz., were acquired, at a cost of \$1,258.11 for addition to the reservation as authorized by the act of March 4, 1931.

EXTENSION OF TRUST PERIODS

The period of trust on reservation and allotted lands was extended during the fiscal year 1933 for 10 years by order of the President on the following reservations:

Round Valley and Temecula Band of Mission Indians, California.
Sac and Fox, Kansas.
Grand Portage and White Earth, Minnesota.
Crow, Montana.
Sac and Fox and Santee, Nebraska.
Devils Lake or Fort Totten, and Standing Rock, North Dakota.
Kiowa and Eastern Shawnee, Oklahoma.
Pine Ridge, South Dakota.
Quinaielt and Yakima, Washington.
Shoshone or Wind River, Wyoming.

FIVE CIVILIZED TRIBES

At the end of the fiscal year of 1933, there was on hand in individual Indian moneys the sum of \$26,458,686.52, represented by cash and Government bonds. Of this amount, approximately \$10,000,000 was deposited in the United States Treasury and banks in Oklahoma. The remaining amount of approximately \$16,500,000 was invested in Government bonds.

Every effort is being made to conserve the cash balances of the individual Indians and to direct as wise an expenditure of the funds as possible. During this fiscal year receipts placed to the credit of the individual Five Tribes Indians amounted to \$2,664,464.29, and disbursements were made from their accounts aggregating \$3,259,170.48 to cover their necessary expenses, education, recreation, purchase of homes, farms, and other necessities incident to their being.

On January 27, 1933, the President approved Public, No. 322 (72d Cong.), which placed restrictions upon all funds held by the Secretary of the Interior belonging to Five Tribes Indians of one half or more Indian blood, both enrolled and unenrolled. This act settled the question as to whether or not certain funds held by the Secretary to the credit of issue born after March 4, 1906, upon which the restrictions terminated on April 26, 1931, were restricted. Considerable

litigation concerning this matter was filed during the year. None of the suits, however, reached a final determination until after the act was passed and our Court of Appeals here held that the Secretary had the jurisdiction so conferred. The suits that were not tried have been dismissed as the restrictive status of the funds has been definitely determined.

Due to the removal of restrictions of alienation affected by the act of May 10, 1928 (45 Stat. 495) and the death of Indians leaving full-blood heirs, there were 245 cases of Indian land sales requiring the approval of the local county courts of Oklahoma. Appearances were entered and appraisals submitted to the county judges by the probate attorneys covering these sales. This procedure enabled the Indians to receive a fair value for the land conveyed. During the year, 737 applications were submitted for the removal of restrictions under the act of May 27, 1908 (35 Stat. 312); 460 were approved, 83 disapproved, and 194 were pending at the end of the year. The lands sold under the removal of restrictions granted brought the present-day values which were depressed.

The appropriation to take care of the work of the probate attorneys was decreased \$10,000. This placed an added burden upon the remaining attorneys who, through laborious efforts, appeared in 2,867 cases during the year and instituted 22 civil actions involving \$25,000. Through their efforts, it is estimated that they saved the restricted Indians over \$100,000. On June 30, 1933, there were pending 4,006 cases in the 40 counties which comprise the Five Civilized Tribes area.

The President approved on June 15, an act (Public, No. 53, 73d Cong.) providing for the payment of \$35 per capita payment to the enrolled citizens of the Seminole Nation of Oklahoma.

The Five Tribes, under jurisdictional acts passed in 1924, have filed 52 suits, and under the jurisdictional act of 1932 certain groups of the Cherokees through their attorneys have filed five suits during the fiscal year. Two suits have been filed, one by the Choctaws and Chickasaws, and the other by the Creeks, as a result of Congressional references. This makes an aggregate of 59 suits that have been filed. Of this number 5 were dismissed prior to this fiscal year and 2 during this year. None of the suits so filed has, as yet, reached a final favorable determination to the Indian Nations.

Under the act of January 27, 1933, supra, the Secretary of the Interior was granted authority to create trusts with reputable trust companies whereby restricted individual Indian moneys of the Five Civilized Tribes could be so invested as to conserve the corpus of their estates. Regulations concerning the creation of these trusts were made and approved by the Secretary of the Interior on June 2, 1933.

There are now pending approximately 100 suits to clear title to the individual allotments of the Five Tribes' Indians. During the past year approximately 40 suits resulted in favorable decrees to the Indians.

LAND SALES

Sales have been completed during the year ending June 30, 1933, of 139 tracts of original allotted lands, aggregating 16,415.83 acres, for a consideration of \$163,398.84, and of 22,500.56 acres of inherited allotments, for \$260,170.50, making a total area of 38,916.39 acres sold for a total consideration of \$423,569.34. This does not mean that all of this area was sold during the fiscal year, as the sales include both cash transactions and deferred payment sales of former years which were completed during the fiscal year 1932-33. Title in deferred payment sales does not pass from the Government until final payment has been made.

There were issued during the same period, 71 patents in fee, releasing 8,791 acres to allottees or to their heirs, and 589 acres were released through issuance of certificates of competency or by removal of restrictions orders.

A decrease in new sales has been noted and many deferred payment sales due to have been completed during the fiscal year have of necessity been extended although a considerable number have been paid up and completed. On most of the large reservations no attempts have been made at all to hold regularly advertised sales, due to the depressed conditions existing and of the lack of ready money and poor crop prices.

Out of the total shown above, about 8,600 acres were sales between Indians on the Fort Berthold Reservation in North Dakota, where an exchange of money amounting to approximately \$40,000 has passed from one Indian's account to another's, thus benefiting many Indians in their endeavors to improve their individual surroundings without the land passing from governmental control or being assessed for taxation purposes.

Considerable inherited land has been divided or partitioned among the heirs and separate trust patents or restricted deeds given to individual heirs. This procedure is being encouraged in lieu of sales of inherited lands so that the heirs, some of whom have no lands, may be better enabled to establish separate homes and cultivate independent units.

We are continuing the cancelation of patents in fee which were issued without application of the Indian during the period when the so-called "declaration of policy" fee patents were given to Indians prior to 1920. These cancelations are authorized by the act of Congress of February 26, 1927 (44 Stats. 1247), as amended by the act of February 21, 1931 (46 Stats. 1205).

Other activities of this section include the preparation of data to accompany departmental recommendations to the Department of Justice in connection with the institution of suits in the Federal courts to recover lands illegally taken from Indians and to recover taxes and to remove lands from tax assessment rolls where the facts show that such lands should not have been taxed.

NOTE.—Since the end of the fiscal year covered in this report the Department has issued an order precluding the further sale of Indian allotments, issuance of patents in fee, etc., which order is quoted in full below:

[Order No. 420]

PRECLUDING FURTHER SALES OF INDIAN ALLOTMENTS, ISSUANCE OF FEE PATENTS, ETC.

UNITED STATES DEPARTMENT OF THE INTERIOR,

OFFICE OF INDIAN AFFAIRS,

Washington, August 12, 1933.

Letter to All Indian Superintendents:

Due to existing economic conditions and the very poor market for Indian-owned restricted lands, it is hereby ordered until further notice that no more trust or restricted Indian lands, allotted or inherited, shall be offered for sale, nor certificates of competency, patents in fee, or removal of restrictions be submitted to the Indian Office for approval, except in individual cases of great distress or other emergency where it appears absolutely necessary that a restricted Indian tract of land be offered for sale for relief purposes. This order includes any sales or applications for patents in fee already made but not yet submitted by you. Gifts of land on restricted deed forms from one Indian to another for all or a partial interest owned by the grantor, or sales between Indians for a valuable consideration where the circumstances justify such transfers, will not be affected by this order, but such sales or gifts should be limited to cases of necessity only. The foregoing shall apply to the Osages and the Five Tribes Indians insofar as the sale of their land is subject to control by this Department.

Please acknowledge receipt of this order.

JOHN COLLIER, *Commissioner.*

Approved, August 14, 1933.

HAROLD L. ICKES,
Secretary of the Interior.

TRIBAL ENROLLMENT

A roll was prepared in accordance with the act of March 3, 1931, of children born to enrolled members of the Blackfeet Tribe between the closing of the final roll, December 30, 1919, and September 3, 1931. This roll was approved September 9, 1932.

In accordance with the provisions of the act of May 18, 1928, as amended, a roll of the California Indians was approved May 16, 1933.

A roll of the Capitan Grande Mission Indians of California was approved March 8, 1933. This roll was for the purpose of dividing the newly purchased Borona Ranch and distributing the proceeds of

the sale of the Old Capitan Grande Reservation by condemnation by the city of San Diego, Calif.

INDIAN SUITS

No new Indian suits were filed in the United States Court of Claims during this fiscal year. The court handed down decisions in the Blackfeet and Assiniboin cases on April 10. A motion for new trial in each of the cases was filed June 10 and the litigation is still in the court.

INDIAN CLAIMS

An appropriation of \$19,357 was authorized by the act of February 16, 1933, to pay claims of individual Sioux Indians awarded under the act of May 3, 1928. The appropriation was carried in the Second Deficiency Appropriation Act and the superintendents have been instructed to disburse the available funds to the Indian claimants.

PUEBLO LANDS

The act of May 31, 1933, made an additional appropriation of \$761,954.88 to the various Pueblos which had been awarded compensation by the Pueblo Lands Board under the act of June 7, 1924, in consideration of the future action of the Pueblos in dismissing all pending suits brought by them and their abstinence from the institution of new litigation. These pueblo compensation funds can by the terms of the act of June 7, 1924, be used only for the purchase of needed lands and waters and for other permanent economic advantages. The Pueblos were given initiative and veto power with respect to the uses of their own funds. An appropriation was made also by the same act to pay the non-Indian claimants in settlement of awards made to them by the Board. The amount appropriated for this purpose was \$232,086.80 in full settlement of the awards. Regulations have been prepared to govern the disbursement of the funds and instructions have been sent to the field officials to make payment.

OIL, GAS, AND OTHER MINERALS

Activity in acquiring and developing restricted Indian lands for oil and gas mining purposes has been at a low ebb during the past fiscal year. The industry has been subject to many uncertainties. The market price of crude oil in the Mid-Continent field, where most of our producing leases are located, has been the subject of more than ordinary variations. Much of this has been due to uncertainty existing in respect to the control of producing wells in the East Texas and Oklahoma City flush fields. A flat posted price of 25 cents a barrel for oil of all gravities was in effect from April 4 to June 17, when the price was raised to 52 cents a barrel. Previously during

the year oil was moved from the Mid-Continent field under prior contracts for as low a price as 10 cents a barrel.

A good grade of oil was discovered within the limits of the Blackfeet Reservation in Montana. Interest in acquiring and developing oil leases on that reservation was accordingly increased and bonus values considerably enhanced.

A number of wells have been completed within what is known as the Maverick Springs oil field within the ceded area of the Shoshone Reservation in Wyoming. The wells have remained closed in for a number of years. Notice was served upon the lessees within the entire ceded Shoshone area to begin producing and selling oil from completed wells by September 1, 1933, or show cause why their leases should not be canceled. Protests were filed by lessees, and the matter was set down for hearing May 17. Thereafter the entire situation was carefully studied with the result that the lessees have agreed to pay \$1 per acre per year additional rental for the lands included in their leases, such additional payment to be allowed to accumulate against production royalties when the marketing of oil begins.

During the year several matters were referred to the Department of Justice with recommendation that suit be instituted to collect damages alleged to be due restricted Indians in Oklahoma because of the pollution of streams and water supply resulting from improper disposition of waste matter from refineries. The total amount involved in claims is \$28,950.

The following statistical information may be of interest:

Number of leases in force at end of year-----	4, 838
Total acreage leased during the year-----	48, 215
Total acreage under lease at end of the year-----	1, 900, 150
Number of producing oil wells drilled during the year-----	52
Number of producing gas wells drilled during the year-----	15
Number of dry holes completed during the year-----	28
Total number of producing oil wells at end of year-----	13, 803
Total number of producing gas wells at end of year-----	622

Gross oil production for year:

Five Civilized Tribes Agency-----	barrels--	12, 344, 658
Osage Agency-----	do--	8, 871, 545
Other agencies-----	do--	1, 291, 073
Income from oil and gas leases for the year-----		\$3, 423, 556. 48

The act of Congress approved April 1932 authorized the making of new leases on developed tracts of the Choctaw and Chickasaw segregated coal lands in Oklahoma. Several leases have since been approved, but interest in these lands is at a very low ebb, primarily because of the great amount of natural gas and fuel oil within the competitive limits of these coal fields.

QUAPAW LEAD AND ZINC LEASES

Within the limits of the Quapaw Indian Reservation in the northeastern corner of Ottawa County, Okla., there are 16,762 acres of restricted land belonging to 159 allottees or heirs of allottees. This area is a part of the tri-State zinc and lead mining district. Lead and zinc mining operations were first undertaken on this reservation in 1902. In 1907 an additional productive area was opened, and in 1914 what is known as the Picher field was discovered. Since 1917 production of lead and zinc from these lands has increased enormously, and at the present time the mines on the reservation on both fee and restricted lands produce 70 percent of the total value of the tri-State district output.

At the close of the fiscal year there were 41 departmental lead and zinc mining leases in force, embracing 5,924 acres. On this acreage there were 18 subleases of 1,127 acres. There were sold from these mines during the year 49,065.32 tons of lead and zinc concentrates, from which the Indians received royalties amounting to \$120,124. The royalty returns from these leases increased 66 percent over the previous year.

During a large part of the year a number of the mines were idle under shut-down permits approved by the Department on applications of lessees.

CANCELLATION OF REIMBURSABLE INDEBTEDNESS

By act of Congress of July 1, 1932 (47 Stat. 564) the Secretary of the Interior is authorized to adjust or eliminate reimbursable charges of the Government of the United States existing as debts against individual Indians or tribes of Indians.

During the year the following debts have been canceled:

Roads and bridges reimbursable from tribal funds-----	\$870,353.53
Tribal herds reimbursable from tribal funds-----	116,970.00
Irrigation, construction operation and maintenance, reimbursable from individual Indians-----	2,128,146.08

Charges against 19 separate roads and bridges were canceled; 10 of these were in the Navajo jurisdiction in the States of Arizona and New Mexico; the others were located in seven States. The indebtedness for tribal herds were for former herds on 4 reservations, 3 in Montana and 1 in Nevada. The indebtedness canceled on irrigation was on 14 irrigation projects in five States.

Further recommendations for the cancelation of reimbursable debts were prepared during the year and will be submitted to Congress at the beginning of its next session. This is in accordance with the provisions of the act referred to above, which requires an annual report to Congress of cancelations which become effective at the end of 60 legislative days if no action is taken on them by Congress.

INDIAN RESERVATION ROADS

The construction and improvement of roads on Indian reservations is one of our greatest needs, both from the standpoint of the convenience of the Indians and for administration purposes. Because of the lack of funds, the reservation road program may be said to be still largely in the pioneer stage. The appropriations for the past 6 fiscal years, given below, speak for themselves. It should be kept in mind that the total land area of these reservations exceeds that of all the New England States together.

Fiscal year	Regular ap- propriation	Special ap- propriation	Fiscal year	Regular ap- propriation	Special ap- propriation
1928-----		\$9,000	1932-----	\$500,000	\$45,000
1929-----		150,000	1933-----	400,000	¹ 1,195,000
1930-----	\$250,000	25,000	Total-----	1,400,000	1,513,000
1931-----	250,000	89,000			

¹ Approximately \$600,000 of the 1933 appropriation was withdrawn in the spring of 1933 under the provisions of the act of Congress of March 31, 1933.

During the year road work has been undertaken on approximately 80 reservations, the work being directly under the superintendents, assisted by a small supervising engineering staff and by local reservation personnel. By act of Congress, Indians are employed for all positions, except engineering, supervision, and machine operative. Even in these positions they are employed where qualified men are available.

In formulating road programs the needs and wishes of the Indians are given careful consideration. Care is also exercised in locating the roads so as to secure proper alinement, grades, and the greatest economic value. With the limited funds available for the work it has been necessary, however, to restrict construction activities to the making of dirt roads, and the graveling or surfacing of many of the roads to permit all-year use is an urgent matter. Preference is given to roads needed for the transportation of children to schools. No funds appropriated to the Indian Service may be used for any work on roads included within the Federal aid system. Close cooperation is maintained between the Indian Service and the counties where county roads have been built on reservations, and county roads of a special benefit to the Indians. A plan has been developed by which, in such counties, the counties furnish the engineer and machinery and the Indian Service furnishes the Indian labor.

Close cooperation is had also with the United States Bureau of Public Roads and other Federal bureaus, which have been very helpful in an advisory capacity.

LEGISLATION

Aside from legislation of general application and appropriation bills, more than 35 separate laws affecting Indian matters were enacted during the year. The importance of these statutes varies. There were five acts authorizing per capita payments to Indian tribes as an aid in overcoming difficulties brought on by adverse economic conditions. There were 10 or more so-called private relief bills involving as many subjects. Of outstanding importance are the following:

Public 241 (72d Cong.), approved July 1, 1932: This act authorized the Secretary of the Interior to adjust reimbursable debts of Indian tribes. On December 15, 1932, the Secretary reported to Congress the cancelation of \$3,115,469.61 and later submitted a report indicating further cancelation of \$153,697.41.

Public 405 (72d Cong.), approved March 1, 1933, commonly referred to as the Paiute Strip bill. This is more fully discussed under the section of the report dealing with land matters.

Public Act 28 (73d Cong.), approved May 31, 1933, relates to matters of vital interest to the Pueblos of New Mexico. This also is discussed at another place in the report.

Public 410 (72d Cong.), approved March 2, 1933: This act authorizes the submission of an alternate budget for the service for the fiscal year 1935, and is the first step in revamping the present complex financing of the activities of the service so that the Indian budget will be understandable to any who examine it, and will show proposed expenditures by functions at each unit in the service.

Public 435 (72d Cong.), approved March 3, 1933, authorized modification of timber contracts to meet present conditions, but specified certain safeguards.

Public 417 (72d Cong.), approved March 3, 1933, modified the act of January 16, 1933, granting relief to water users on Indian reclamation projects. These acts applied to the Indian Service relief measures similar to those afforded occupants of other Federal irrigation projects.

Public 427 (72d Cong.), approved February 3, 1933, authorized the use of more than \$1,000,000 awarded the Uintah and other Ute Indians, Utah, for purposes of direct benefit to the individual members of the tribe, thus removing the fund from obligation for administrative purposes.

Several hundred pieces of legislation introduced in the House and Senate were reported upon during the course of the year. Some matters considered of vital importance could not be acted upon favorably because of unfavorable financial conditions.

CONSTRUCTION

The major construction activities included roads, day schools, and hospitals, the details of which are related under the appropriate headings in this report. Due to the pressing demand for economy, construction appropriations available for 1933, exclusive of road funds, were nearly \$4,000,000 less than for last year. During March 1933 practically all construction was stopped abruptly, and the unexpended balances of appropriations impounded. This threw many

Indians and others out of work, retarded the development of our day-school program, and increased the demands for relief on many reservations. Requests have been prepared for submission to the Public Works Administration for funds to replace those impounded and to enlarge to a considerable extent the construction activities of the service. It is our aim to have buildings designed in harmony with local surroundings, using native building materials wherever possible, and giving the maximum of employment to Indians.

INDIAN RELIEF

General economic conditions among the bulk of the Indian population continued unfavorable during 1933. In common with the general trend throughout the country, the extent of Indian relief has increased manyfold during the past few years.

Generally unfavorable economic conditions, particularly in the farming and livestock industries from which the greater part of the normal Indian income is directly or indirectly derived, and the difficulty—even impossibility—of securing outside employment have naturally reacted to the serious disadvantage of the Indian. In the vicinity of many of the reservations, work for Indians, able-bodied and willing, was simply not to be had. The market for Indian handicraft and other products has dwindled. The traders are overstocked with such goods; the volume of credit which these merchants could extend the Indians has been greatly curtailed.

Some sections witnessed a recurrence during 1933 of serious drought conditions and grasshopper infestations, though the Indians' crops, particularly their subsistence gardens, showed considerable improvement over the previous year. During the spring and summer of 1932 particular emphasis was placed upon a subsistence gardening campaign among all the Indian tribes; also upon canning, drying, and storing campaigns with the Indian women. The Indian Service assisted by providing seed, implements, and other needs, and by furnishing the initial advice and encouragement and the necessary follow-up work. Results were gratifying.

It is extremely difficult adequately to budget the relief needs of the service a year or more in advance. The unusual needs of the past winter, therefore, have meant a marshaling of all possible sources of help to supplement the inadequate amount of money available in our regular gratuity and tribal support appropriations. Based upon our presentation of probable needs the Congress granted us an additional \$50,000 for relief purposes in the second deficiency act, fiscal year 1932.

More than 40 carloads of clothing was secured for issue to needy Indians from surplus stocks of the War Department. Among the items included were 35,000 pairs of breeches, 123,000 suits of woolen

underwear, 6,000 coats, 40,000 overcoats, 33,000 shirts, 24,000 pairs of shoes, 176,000 pairs of socks, 25,000 caps, 10,000 pairs of leggins, and 1,000 mufflers.

The Indians continued to share in the distribution of flour and of cotton goods and garments through the Red Cross. Approximately 5,000,000 pounds of flour were secured from this source, together with many thousands of yards of prints, gingham, muslin, outing flannel, shirting and other kinds of cloth, and a large quantity of underwear, hose, outer garments, sweaters, comforters, and blankets. In the distribution of these garments especial attention was given the need of the women and children, the clothing received from the War Department surplus being almost entirely for the men.

The whole-hearted and efficient cooperation of the American Red Cross in Indian relief work during the past 2 years is gratefully acknowledged.

Almost our sole source of Indian work relief during the fiscal year was the \$1,400,000 of road money made available by Congress, \$1,000,000 in the Emergency Relief Act, and \$400,000 in the regular annual appropriation act. This money was apportioned with relief needs in mind, and served the twofold purpose of furnishing needy Indians with employment and providing low-cost reservation roads for Indian use.

Much help was secured for scattered Indians through the cooperation of some of the better organized State relief programs. Notably in Wisconsin, Minnesota, South Dakota, and Montana, the State relief administrations included scattered Indians in their program, and in return the Indian Service field officials frequently served ex officio as agents for the State or as members of local county committees.

The launching of the emergency conservation program at the end of the fiscal year marked the beginning of a constructive and adequate program. Combined with other public-works enterprises, it promises a planned and systematic work-relief program which will be a satisfying substitute for the strain of the necessarily precarious program of the past year.

The compelling thought underlying any Indian Service relief work is that the Indian is not to be pauperized, is not to be led to feel that he is automatically entitled to be accepted as a responsibility of the Federal Government simply because he has a degree of Indian blood. The attitude of the bulk of the Indian population is most heartening, and it is our hope and belief that when the present depression shall have passed, the Indian people will have lost little, if any, ground in their progress toward the goal of self-support and economic independence.

REORIENTING INDIAN LAND POLICY

It is only recently that we have come fully to realize the magnitude of the disaster which the allotment law of 1887 has wrought upon the Indians. This law, in its origin, was intended to be a civilizing instrument for the Indians. It was reasoned that white civilization was based on the individual property system, and it was naively assumed that the way to make the Indian a responsible citizen was forcibly to give him private property and extinguish his concern in community property. But, in fact, the allotment law turned out to be principally an instrument to deprive the Indians of their lands. The successive steps of loss are easy to trace: Each Indian on the allotted reservations was given an allotment of about 160 acres, which was held in trust by the Government for a time and then turned over in fee simple to the allottee. In most cases, the allottees sold their land to white settlers in order to have "easy money" for quick spending. If the allottee died before the end of the trust period, the land passed to his heirs. Often there were numerous heirs, and the practicable method of settling the estate was to sell it and divide the money among the claimants. A third step in the loss of Indian land came from the disposal of so-called "surplus" lands which were left after allotments had been made to all Indians of the reservations. These surplus lands were then opened to entry and were homesteaded by white settlers.

Of the lands owned by the Indians in 1887, the year of the allotment law, two thirds have been lost by these various processes of dissipation. In addition, some 17 million acres are now traveling the same route to ultimate loss, although the Department by administrative order has stopped the further sale of "heirship" lands pending revision or repeal of the allotment law. As was to have been expected, much of the lost land has been the best, leaving often the cull remnants for the Indians.

The allotment system has been peculiarly unfortunate in its application to forest and grazing lands. For sustained forest management, directed to continuous tree-crop production, it is essential that timber lands be managed in large, contiguous areas. Likewise, good management of range lands can best be brought about by community use. The partition of the Indian forests and grazing ranges has made intelligent management of these resources in many cases impossible or exceedingly difficult.

How, then, shall we reorient Indian land policy? It is clear that the allotment system has not changed the Indians into responsible, self-supporting citizens. Neither has it fitted them to enter into urban industrial pursuits. It has merely deprived vast numbers of them of their land, turned them into paupers, and imposed an ever-growing relief problem on the Government. As a starting point for

a rational policy, we can categorically say that the immediate problem is not that of absorbing the Indians into the white population, but first of all of lifting them out of material and spiritual dependency and hopelessness. It is equally clear that the place to begin this process is on the land; for if the Indian cannot pursue the relatively simple and primitive arts of agriculture, grazing, and forestry, there seems little prospect that he can be fitted for the more exacting technology of urban industry. Even if he could be at once so fitted, the industrial depression has taught us that we already have far too many industrial workers. And the agricultural depression has taught us that we have a great surplus of farm land. Through subsistence farming and animal husbandry, the Indian can become self-supporting without competing, on the one hand, with white industrial labor or, on the other hand, with white commercial agriculture.

If these assumptions are sound, the main lines of the new land policy are clear. The allotment system must be reversed. We must reacquire enough of the lost lands or of other lands to provide subsistence for eighty or ninety thousand landless Indians. In the case of forest and range lands, we must reestablish tribal ownership and build up Indian use of these resources instead of allowing the resources to be exploited by whites. Even in the case of agricultural lands, community ownership, with assignment of use to individual Indians, will in many reservations be the best system of ownership. In addition to land, we must provide capital in the way of buildings and other improvements, work stock, livestock, and farming equipment to help the Indian farmer or livestock grower onto his feet. In the forests we must provide small portable sawmills and logging equipment in order to employ the Indian workers in harvesting their own tree crops. Equipping the land for productive use will require, in short, the provision of credit facilities for the Indians.

If we can relieve the Indian of the unrealistic and fatal allotment system, if we can provide him with land and the means to work the land, if through group organization and tribal incorporation we can give him a real share in the management of his own affairs, he can develop normally in his own natural environment. The Indian problem as it exists today, including the heaviest and most unproductive administration costs of public service, has largely grown out of the allotment system which has destroyed the economic integrity of the Indian estate and deprived the Indians of normal economic and human activity.

Sincerely yours,

JOHN COLLIER,
Commissioner.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal or inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

Since funds were not available to secure the services of temporary employees for coding and tabulating the 1933 census rolls, the April 1, 1933, Indian population was tabulated in the field by the various agencies. In order to check the tabulation made from the census rolls three additional tabulations were required, showing all changes made on census rolls since 1932. One tabulation shows the changes by exact cause under the two headings, "Additions" and "Deductions". Under "Additions" were shown separately the births for the past year, unreported births for previous years, enrollment by departmental authority, etc., while under "Deductions" were grouped separately deaths for the past year, unreported deaths for previous years, dropped by departmental authority because of wrongful enrollment, duplications, etc. The second tabulation reports these same changes by residence of Indians, and the third tabulation shows all Indians on both the 1932 and 1933 census rolls who have changed their residence—the residence in 1932 reported under "Deductions" and the residence in 1933 under "Additions". The additions and deductions on the second and third tabulations were added to and subtracted from the 1932 population and the results equal the tabulations from

the 1933 census rolls. This gives not only a check on the tabulations but an analysis of all changes at each jurisdiction.

The total estimated and enumerated number of Indians thus reported in 1933 was 320,454. This number consists of 231,754 Indians actually enumerated and 88,700 Indians taken from earlier or special censuses and estimates based on records. For convenience, the latter number will be considered hereafter as an estimate. (See tabular statement below.)

The Bureau of the Census reported 72,643 Indians of the Five Civilized Tribes in 1930, and this number has been substituted for our previous estimated population of the Five Civilized Tribes. (See p. 49 of the Annual Report of the Commissioner of Indian Affairs, June 30, 1931, for further discussion on the estimated population for Five Civilized Tribes.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on April 1, 1933, represents an increase over the corresponding figure for the previous year of 3,220 or 1 percent.

Of the 231,754 Indians enumerated, 118,076 were males, 113,672 females, and for 6 the sex was not reported.

It is significant when the Indians enumerated are considered that 197,852, or 85.4 percent, resided at the Federal jurisdiction where enrolled, while only 5,013, or 2.2 percent, resided at another jurisdiction, and 28,889, or 12.5 percent, resided elsewhere; that is, outside of any Federal jurisdiction.

Of the 32,447 Indians residing elsewhere on April 1, 1930, 41 were living in the New England States, 208 in the Middle Atlantic, 3,633 in the East North Central, 9,234 in the West North Central, 437 in the South Atlantic, 93 in the East South Central, 2,166 in the West South Central, 5,120 in the Mountain States, and 6,024 in the Pacific States, and for 5,491 Indians the residence was either not reported or unknown.

The combined population of four States, Oklahoma, Arizona, New Mexico, and South Dakota, is 199,388, or 62.2 percent of the total Indian population.

Oklahoma has far more Indians than any other State. If the Federal census population for the Five Civilized Tribes is included, the Indian population is 94,707, or 29.6 percent of the aggregate Indian population. Arizona ranks next with 43,927, or 13.7 percent, followed by New Mexico with 34,196, or 10.7 percent, and South Dakota, 26,558, or 8.3 percent of the total population. According to the enumerated population no other State has an Indian population of over 15,000.

Heretofore the entire population of Southern Navajo Reservation was reported under Arizona. This year the population of the reservation extending over into New Mexico is included under that State,

hence the seeming decrease in the population of Arizona and the unusual population increase in New Mexico.

A census of all California Indians was recently compiled, the rolls being approved by the Bureau of Indian Affairs on May 16, 1933, too late, however, to be included under this year's enumerated population. The California rolls numbered 23,787, as approved. This number includes 19,304 Indians now enrolled and reported in table 2, and shown in estimated statement. Next year this census will add to the enumerated Indian population of California over 4,400 Indians.

According to a tabulation of the tribes enumerated on April 1, 1930, the most important numerically were the Navajo, Sioux, including Assiniboin, and Chippewa, numbering 40,862, 33,168, and 23,647, respectively.

The Indian population not actually enumerated (termed an estimate) is 88,700, which is compiled as follows:

California, Sacramento Agency, part of, 1930 estimate	8,761
Michigan, 1927 census	1,192
New York, 1932 estimate	4,523
Oklahoma, Five Civilized Tribes, Bureau of the Census, 1930	72,643
Texas, 1931 special report	250
Washington, Taholah Agency, scattered bands, 1932 estimate	¹ 511
Wisconsin:	

Rice Lake Band of Chippewas, special census, July 1930----- 221

Stockbridge Reservation, Keshena Agency, 1910 census----- 599

In the following table the Indian population as reported by the United States Fifteenth Census for 1930 is given for States in which there are no Federal agencies.

Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2, showing Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, April 1, 1933.

Table 1.—Indian population ^a of States in which there are no Federal Agencies, 1930

Division and State	Total	Male	Female	Division and State	Total	Male	Female
Total -----	10,456	5,557	4,899	South Atlantic:			
New England:				Delaware-----	5	3	2
Maine-----	1,012	518	494	Maryland-----	50	34	16
New Hampshire-----	64	33	31	District of Columbia-----	40	17	23
Vermont-----	36	20	16	Virginia-----	779	436	343
Massachusetts-----	874	458	416	West Virginia-----	18	15	3
Rhode Island-----	318	154	164	South Carolina-----	959	474	485
Connecticut-----	162	90	72	Georgia-----	43	26	17
Middle Atlantic:				East South Central:			
New Jersey-----	213	123	90	Kentucky-----	22	16	6
Pennsylvania-----	523	305	218	Tennessee-----	161	85	76
East North Central:				Alabama-----	465	228	237
Ohio-----	435	252	183	West South Central:			
Indiana-----	285	158	127	Arkansas-----	408	210	198
Illinois-----	469	250	219	Louisiana-----	1,536	800	736
Western North Central:				Texas ^b -----	1,001	516	485
Missouri-----	578	336	242				

^a Fifteenth Census of the United States, 1930.

^b 250 Indians are included in the preceding tabular statement.

¹ During 1933, 150 Indians of the scattered bands were allotted on the Quinalt Reservation and included in the enumerated population, table 2.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933.

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere				
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total enumerated Indian population	231,754	118,076	113,672		6	197,852	101,455	96,391	6	5,013	2,464	2,549	28,889	14,157	14,782		
Arizona	43,927	22,677	21,244		6	42,262	21,810	20,446	6	248	113	135	1,417	754	663		
Colorado River Agency	1,129	618	511		601	326	235		31	21	10	497	271	226			
Colorado River Reservation	687	369	318		637	286	231		24	18	6	126	65	61			
Chemeuevi-Chippewa					135	87	87		1	1		97	47	50			
Chemeuevi-Paiute					137	87	87										
Chemeuevi-Papago					1	1	1										
Cocopah																	
Mission																	
Mojave																	
Mojave-Chemeuevi																	
Mojave-Cocopah																	
Mojave-Hopi																	
Mojave-Papago																	
Mojave-Pawnee																	
Mojave-Pima																	
Mojave-Pueblo																	
Mojave-Yuma																	
Paiute																	
Yuma																	
Fort Mojave Reservation	442	249	193		64	40	24		7	3	4	371	206	165			
Chemeuevi																	
Maidu																	
Mojave																	
Mojave-Maidu																	
Mojave-Mission																	
Mojave-Paiute																	
Mojave-Pima																	
Mojave-Yuma																	
Paiute																	
Fort Apache Agency and Reservation (Apache)	2,737	1,429	1,308		2,704	1,409	1,295		5	3	2	28	17	11			
Fort Yuma Agency in California, and Cocopah Reservation (Cocopah)																	
Havasupai Agency and Reservation (Havasupai)																	
Total	26	15	11		26	15	11		201	111	90	90					

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

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For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1883—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere					
	Total		Male	Female	Sex not re-reported		Total	Male	Female		Sex not re-reported	Total	Male	Female		Total	Male	Female
California—Continued.																		
Fort Yuma Agency, see Arizona, and Fort Yuma Reservation (Yuma).																		
Hoopo Valley Agency																		
Hoopo Valley Reservation																		
Hopoo.																		
Klamath.																		
Rancheria																		
Bear River (Bear River)																		
Blue Lake (Blue Lake)																		
Crescent City (Smith River)																		
Eel River (Miami)																		
Smith River (Smith River)																		
Mission Agency																		
Augustine Reservation (Mission)	14	8	6	6			1,966	1,087	879	6	2	4	928	452	476	476	476	476
Cabezon Reservation (Mission)	28	17	11	11			12	7	5				2	2	2	2	2	2
Cahuiilla Reservation (Mission)	105	55	50	50			23	12	11				5	5	5	5	5	5
Campo Reservation (Mission)	136	71	65	66			66	36	30				39	19	20	20	20	20
Capitan Grande Reservation (Mission)	156	82	74	74			117	60	57				1	1	1	18	18	18
Cuyapaape Reservation (Mission)	5	1	4	4			124	70	54				1	1	1	32	32	32
Iniaia Reservation (Mission)	32	16	16	16			3	3	3				2	2	2	12	12	12
Laguna Reservation (Mission)	3	2	1	1			27	12	15				5	4	5	1	1	1
La Jolla Reservation (Mission)	222	120	102	102			102	50	50				102	50	52	52	52	52
La Posta Reservation (Mission)	5	2	3	3			4	2	2				1	1	1	1	1	1
Los Coyotes Reservation (Mission)	87	59	37	37			67	42	25				20	8	12	12	12	12
Manzanaita Reservation (Mission)	66	37	37	37			57	28	29				9	1	1	8	8	8
Mesa Grande Reservation (Mission)	216	120	96	134			79	55	3			2	79	40	39	39	39	39
Mission Creek Reservation (Mission)	21	11	10	13			13	7	6				8	4	4	4	4	4
Morongo Reservation (Mission)	294	157	137	192			116	77	77				102	42	60	60	60	60
Pala Reservation (Mission)	203	106	97	148			97	77	77				54	29	25	25	25	25
Palm Springs Reservation (Mission)	49	23	26	48			23	25	25				1	1	1	1	1	1
Pauma Reservation (Mission)	69	38	31	46			38	28	18				13	10	10	10	10	10
Pechanga Reservation (Mission)	219	111	108	95			111	44	44				124	60	64	64	64	64
Rincon Reservation (Mission)	183	98	86	99			98	52	47				84	46	38	38	38	38
San Manuel Reservation (Mission)	42	23	19	27			42	16	16				5	2	2	2	2	2
San Pascale Reservation (Mission)	5	4	5	3			5	2	2				9	1	1	1	1	1

Santa Rosa Reservation (Mission)	49	30	19	23	13	10	26	17	9
Santa Ynez Reservation (Mission)	92	43	49	11	11	9	72	32	40
Santa Ysabel Reservation (Mission) -	238	132	106	172	97	75	65	35	30
Soboba Reservation (Mission)	126	63	63	107	53	54	19	10	9
Sycuan Reservation (Mission)	36	17	19	34	17	17	2	2	2
Torres-Martinez Reservation (Mission)	195	112	83	182	105	77	13	7	6
Fort Bidwell Reservation	3,310	1,698	1,612	3,079	1,576	1,503	14	8	6
Mojave -	122	74	48	82	50	32	9	5	4
Paiute -	115	73	42	80	50	30	9	5	4
Paiute-Mojave -	3	1	2	2	2	2	2	1	2
Paiute-Wasco -	2	2	2	2	2	2	1	1	1
Snohomish -	1	1	1	1	1	1	1	1	1
Fort Bidwell Reserve and Public Domain Allotments	448	215	233	326	155	171	1	121	59
Maidu -	123	60	63	27	13	14	-	-	62
Paiute -	308	147	161	282	134	148	-	-	-
Pit River -	16	7	9	16	7	9	1	1	49
Pit River-Paiute	522	414	408	783	389	394	4	2	25
Kato -	195	107	88	191	104	87	1	1	12
Maidu -	3	1	2	3	1	2	-	-	13
Mission-Pomo -	1	1	1	1	1	1	-	-	1
Papago-Pomo -	40	24	16	33	19	14	1	1	5
Pit River-Pomo	103	49	54	95	42	53	2	1	6
Pomo -	24	11	13	24	11	13	-	-	6
Pomo-Maidu -	18	9	9	18	9	9	-	-	-
Pomo-Wintoon-Wailaki	1	1	1	1	1	1	-	-	-
Wailaki -	190	84	106	179	80	99	-	-	7
Wailaki-Maidu -	16	9	7	16	9	7	-	-	1
Wailaki-Wintoon -	5	1	4	5	1	4	-	-	-
Whilkut -	12	9	3	9	6	3	-	-	3
Wintoon -	114	59	55	110	57	53	4	4	2
Wintoon-Maidu -	2	1	1	2	1	1	-	-	-
Wintoon-Pomo -	3	2	1	3	2	1	-	-	-
Yuki -	69	32	37	67	31	36	-	-	-
Yuki-Kato -	4	2	2	4	2	2	-	-	-
Yuki-Maidu -	4	3	1	4	3	1	-	-	-
Yuki-Pomo -	13	8	5	13	8	5	-	-	-
Yuki-Wailaki -	1	1	1	1	1	1	-	-	-
Tulare County Indians	121	66	55	121	66	55	2	2	2
Apache-Navajo -	1	1	1	1	1	1	-	-	-
Cherokee -	2	2	2	2	2	2	-	-	-
Cherokee-Wakaschi -	4	2	2	4	2	2	-	-	-

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere				
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female	Total	Male	Female
Colorado																	
Consolidated Ute Agency, see Utah	819	416	403	-----	808	411	397	-----	8	3	5	3	2	1	1	1	1
Southern Ute Reservation (Ute)	353	188	195	-----	376	185	191	-----	6	3	3	1	2	1	1	1	1
Ute Mountain Reservation (Ute)	436	228	208	-----	432	226	206	-----	2	1	2	1	2	1	1	1	1
Florida: Seminole Agency and Reservation (Seminole).....	565	280	288	-----	568	280	288	-----	168	103	65	489	231	258	102	102	102
Idaho	4,202	2,056	2,116	-----	3,515	1,752	1,793	-----	144	9	5	189	87	255	94	94	94
Coeur d'Alene Agency, see Washington	745	372	376	-----	545	276	269	-----	14	9	5	115	81	102	88	88	88
Coeur d'Alene Reservation	633	311	322	-----	444	221	223	-----	11	7	4	169	81	94	88	88	88
Coeur d'Alene-Blackfeet	565	279	279	1	378	191	187	-----	11	7	4	1	1	1	1	1	1
Coeur d'Alene-Cherkee	9	5	4	-----	8	4	4	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Chippewa	1	1	1	-----	1	1	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Colville	5	1	4	-----	4	1	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Cree	12	6	6	-----	12	6	6	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Flathead	11	4	7	-----	9	4	5	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Kalispel	1	1	1	-----	1	1	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Kootenai	1	1	1	-----	1	1	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Maidu	2	1	1	-----	2	1	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Nz Perce	3	2	1	-----	3	2	1	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Okanagan	19	8	11	-----	16	7	9	-----	1	1	1	1	1	1	1	1	1
Coeur d'Alene-Spokane	7	2	5	-----	7	2	5	-----	1	1	1	1	1	1	1	1	1
Cree	2	2	2	-----	2	2	2	-----	1	1	1	1	1	1	1	1	1
Kootenai Reservation	115	61	54	-----	101	55	46	-----	14	6	8	11	6	8	6	6	6
Kootenai	109	59	50	-----	98	53	45	-----	11	6	5	59	31	51	5	5	5
Bannock	6	2	4	-----	3	2	1	-----	3	3	3	188	94	94	3	3	3
Bannock-Cotville	940	808	808	-----	1,616	825	791	-----	34	21	13	16	9	57	7	7	7
Fort Hall Agency and Reservation, see Utah	1,838	144	131	298	1,201	109	99	-----	23	15	8	111	54	57	16	16	16
Bannock	69	30	39	66	30	36	31	-----	2	2	2	16	9	7	1	1	1
Maidu-Bannock	1	1	1	1	1	1	1	-----	1	1	1	59	31	28	1	1	1
Shoshone-Bannock	1,332	689	633	1,198	620	578	66	77	2	2	2	111	54	57	1	1	1
Shoshone-Bannock-Peace	161	77	84	143	143	143	66	77	2	2	2	16	9	7	1	1	1
Fort Lapwai Agency and Nez Perce Reservation (Nez Perce)	1,417	666	751	1,210	556	654	100	63	37	107	47	60	1	1	1	1	1
Western Shoshone Agency and Reservation, in Nevada-Paiute	199	108	91	105	174	95	79	-----	20	10	5	3	2	2	1	1	1
	124	70	64	105	61	44	17	8	9	2	2	2	1	1	1	1	1

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies [according to tribe, sex, and residence Apr. 1, 1893.—Continued

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence April 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere			
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female	Total	
Montana—Continued.																
Tongue River Agency and Reservation																
Cheyenne—	1,516	780	736	1,433	736	719	697	682	59	32	27	24	12	12	12	12
Cheyenne-Arapaho—	1,469	753	716	1,401	719	682	682	682	46	23	22	22	11	11	11	11
Cheyenne-Arikara—	2	1	1						2	1	1					
Cheyenne-Chippewa—	6	2	4		6	2	4									
Cheyenne-Cree—	2	1	1		2	1	1									
Cheyenne-Crow—	9	4	5		9	4	5									
Cheyenne-Kiowa—	3	2	1		3	2	1									
Cheyenne-Siouux—	2	2	2		2	1	1									
Siouks—	13	8	2		10	6	4									
Nebraska																
Winneshiek Agency Reservation	4,446	2,291	2,155	3,972	1,554	1,518	1,062	1,062	336	196	160	1,018	541	477	477	477
Omaha-Bannock—	2,770	1,330	1,230	2,163	1,101	1,063	720	720	43	48	48	487	267	220	220	220
Omaha-Chippewa—	1,635	833	762	1,333	684	649	322	322	18	14	14	230	131	99	99	99
Omaha-Iowa—	1,542	804	738	1,282	655	627	322	322	18	14	14	228	131	97	97	97
Omaha-Ponca—	2	3	3	6	3	3	3	3								
Omaha-Potawatomi—	22	10	12	22	10	12	12	12								
Omaha-Senecca—	4	2	2	4	2	2	2	2								
Omaha-Siouxs—	6	5	1	6	5	5	1	1								
Winnebago—	5	4	1	5	4	4	1	1								
Winnebago-Kickapoo—	2	2	2	2	2	2	2	2								
Winnebago-Omaha—	1,175	607	568	830	417	413	88	88	54	34	34	257	136	121	121	121
Winnebago-Sac and Fox—	1,154	598	556	815	412	403	87	87	53	34	34	252	133	119	119	119
Winnebago-Siouxs—	3	1	3	3	3	3	3	3	1	1	1	*	*			
Winnebago-Sioux—	12	4	8	10	3	3	3	3	2	2	2	2	1	1	1	1
South Dakota																
Yankton Agency, in South Dakota	1,676	851	825	909	453	450	236	236	124	112	112	531	274	257	257	257
Ponca Reservation (Ponca)	339	192	207	191	96	95	23	23	11	12	12	185	85	100	100	100
Sanite Reservation (Sanite)	1,277	659	618	718	357	361	233	233	113	100	100	346	189	157	157	157
Nevada	5,083	2,535	2,548	4,779	2,396	2,383	204	204	88	87	87	100	51	49	49	49
Carson School Jurisdiction	2,700	1,003	1,067	1,985	972	1,013	81	81	27	54	54	22	5	17	17	17
Fort Mcbermitt Reservation (Paiute)	270	125	145	145	248	248	120	120	128	128	128	34	31			
Surround Lake Reservation (Paiute)	65	34	34	34	65	65	34	34	34	34	34	34	31			

Public Domain		844	891	1,672	818	69	22	37	4
Paiute	104	139	239	102	137	3	1	2	1
Paiute-Miami	1	1	1	1	1				
Shoshone	926	445	481	925	445	480	1	1	
Washo	548	284	264	491	261	230	54	20	3
Washo-Klamath	1	1	1	1	1	1	1	1	3
Washo-Oneida	2	1	1	2	1	1			
Washo-Paiute	14	9	5	14	9	5			
Pyramid Lake Agency and Reservation		572	287	285	511	255			
Paiute	506	284	282	605	253	252			
Paiute-Washo	2	2	2	2	2	2			
Shoshone	3	1	2	3	1	2			
Washo	1	1	1	1	1	1			
Paiute Agency, in Utah		198	97	101	179	89			
Moapa River Reservation (Paiute)	167	79	78	141	72	69			
Las Vegas Tract (Paiute)	41	18	23	38	17	21			
Walker River Agency, see California	1,734	880	854	1,671	849	822			
Fallon Reservation (Paiute)	424	215	209	405	204	201			
Mason and Smith Valleys	436	221	215	419	215	204			
Maidu	1	1	1	1	1	1			
Paiute	411	206	205	394	200	194			
Paiute-Miabi	2	1	1	2	1	1			
Paiute-Washo	2	2	2	2	2	2			
Washo	20	11	9	20	11	9			
Nye County scattered Indians		369	187	182	369	187			
Paiute	29	16	13	29	16	13			
Shoshone	340	171	169	340	171	169			
Walker River Reservation		505	257	248	478	243			
Paiute	454	231	223	430	218	212			
Paiute-Washo	3	1	2	1	1	1			
Shoshone	47	24	23	47	24	23			
Washo	1	1	1	1	1	1			
Western Shoshone Agency and Reservation, see Idaho		509	268	241	433	230			
Hopi	1	1	1	1	1	1			
Hopi-Shoshone-Paiute	7	4	3	2	2	2			
Paiute	84	47	37	79	43	36			
Shoshone	249	134	115	207	112	95			
Shoshone-Paiute	167	82	85	145	73	72			
Shoshone Washo	1	1	1	1	1	1			

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and race Apr. 1, 1883—Continued

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		494	1,060	576	484	27	17	10
Isetta Pueblo	Navajo-Pueblo	693	2	2	2	2	2	2
Pueblo	—	589	403	1,050	575	484	23	14
Pueblo-Najajo	—	1	1	1	1	1	1	1
Pueblo-Zuni	Jemez Pueblo	1	1	1	1	1	1	1
Pueblo	—	658	356	302	652	353	299	1
Pueblo	—	657	355	302	652	353	299	1
Pueblo-Zuni	—	1	1	1	1	1	1	1
Laguna Pueblo	—	2,236	1,465	1,061	1,352	924	23	5
Pueblo	—	2,159	1,128	1,031	1,911	1,003	908	15
Pueblo-Apache	—	10	5	5	4	3	1	1
Pueblo-Chippewa	—	6	2	4	6	2	4	6
Pueblo-Hopi	—	8	2	6	2	1	1	5
Pueblo-Kickapoo	—	1	—	1	—	—	1	1
Pueblo-Maidu	—	2	2	2	2	2	1	1
Pueblo-Mission	—	6	3	3	6	3	3	2
Pueblo-Navajo	—	18	11	7	15	9	6	1
Pueblo-Paiute	—	1	—	1	—	—	1	1
Pueblo-Papago	—	2	2	2	2	2	1	1
Pueblo-Seneca-Mohawk	—	12	9	3	6	5	2	2
Pueblo-Zuni	Santa Ana Pueblo (Pueblo)	123	66	57	118	64	54	1
Pueblo	Santo Domingo Pueblo (Pueblo)	567	316	251	566	316	250	1
San Felipe Pueblo	—	561	313	248	561	313	248	1
Pueblo	—	2	1	1	2	1	1	1
Pueblo-Cheroh	—	1	—	1	—	—	—	—
Pueblo-Papago	—	1	—	1	—	—	—	—
Pueblo-Zuni	—	3	1	2	2	1	1	1
Santa Ana Pueblo (Pueblo)	245	146	99	245	146	99	1	1
Santo Domingo Pueblo (Pueblo)	861	493	368	861	493	368	1	1
Sia Pueblo (Pueblo)	187	102	83	184	100	84	3	2
Zuni Agency and Pueblo	Hopi	2,021	1,131	890	1,985	1,101	884	11
Klamath	—	1	1	1	1	1	1	1
Navajo	—	4	4	4	4	4	1	1
Pima	—	2	2	1	1	1	1	1
Pueblo	—	2,013	1,131	882	1,979	1,101	878	10
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	—	3,247	1,721	1,526	2,809	1,487	1,322	183
North Dakota: Fort Berthold Agency and Reservation	Arikara	9,911	5,025	4,886	6,326	3,284	3,142	10
—	—	1,355	757	778	1,465	722	743	16
—	—	505	250	255	470	236	234	3
—	—	1	—	1	—	—	1	1
—	—	8	4	4	5	2	3	1
—	—	12	—	12	12	12	12	1
—	—	2	—	1	2	1	1	1
—	—	5	2	3	5	2	3	3
—	—	638	317	321	623	308	315	13

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing elsewhere					
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
North Dakota—Continued.														
Fort Berthold Agency and Reservation—Continued.														
Gros Ventre-Arapaho	1	1	1	1	8	5	3	0	1	1	0	1	1	1
Gros Ventre-Chippewa	8	5	3	0	17	8	9	0	2	1	1	0	2	1
Gros Ventre-Mandan	17	8	9	0	6	6	5	0	1	1	0	1	1	1
Gros Ventre-Siouxs	12	6	6	0	2	1	1	0	0	0	0	0	0	0
Gros Ventre-Winnebago	2	1	1	0	141	141	0	276	137	138	3	1	2	3
Mandan-Arikara	281	140	141	0	1	1	0	4	3	1	1	0	1	1
Mandan-Chippewa	4	3	1	0	1	1	0	22	9	13	0	0	0	0
Mandan-Gros Ventre	1	1	0	0	22	9	13	0	0	0	0	0	0	0
Mandan-Gros Ventre	22	9	13	0	16	11	5	0	11	6	5	0	5	5
Fort Totten Agency and Devil's Lake Reservation (Sioux).														
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	972	502	470	0	890	461	429	0	39	19	20	43	22	21
Standing Rock Agency and Reservation, see South Dakota (Sioux)	48	29	19	0	48	29	19	0	51	21	30	84	35	49
Turtle Mountain Agency and Reservation (Chippewa)	1,620	810	810	0	1,485	754	731	0	51	21	30	3,421	1,572	1,548
Oklahoma ⁷	5,736	2,927	2,869	0	2,638	1,318	1,220	0	77	37	40	5,023	2,453	2,570
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)	22,064	11,081	10,983	0	16,447	8,326	8,121	0	594	302	292	0	0	0
Kiowa Agency	2,742	1,417	1,325	0	2,423	1,236	1,187	0	140	74	66	179	107	72
Kiowa Reservation	5,816	2,846	2,970	0	5,682	2,779	2,903	0	37	24	13	97	43	54
Apache	4,444	2,176	2,268	0	4,387	2,149	2,238	0	22	12	10	35	15	20
Apache-Comanche	311	166	145	0	104	104	145	0	1	1	0	1	1	1
Apache-Kiowa	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Comanche	13	7	6	0	13	7	6	0	0	0	0	0	0	0
Comanche-Apache	977	1,018	1,018	0	967	966	1,001	0	4	4	4	24	11	13
Comanche-Caddo	13	6	6	0	13	7	6	0	0	0	0	0	0	0
Comanche-Kiowa	8	5	3	0	8	5	3	0	0	0	0	0	0	0
Kiowa	2,29	14	15	0	29	14	15	0	0	0	0	0	0	0
Kiowa-Apache	2,032	979	1,033	0	2,005	965	1,040	0	17	11	6	10	3	7
Kiowa-Cheyenne	22	12	10	0	22	12	10	0	1	1	1	0	0	0
Kiowa-Comanche	1	1	1	0	1	1	1	0	10	8	10	0	0	0

SUMMARIES OF BUREAU REPORTS

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Wichita Reservation—									
Caddo-Delaware	773	702	1,295	16	12	3	62	28	34
Caddo-Wichita	106	53	712	358	10	8	2	51	27
Delaware-Caddo	5	2	106	53	53	53	3	53	24
Delaware	112	51	61	112	5	2	1	2	1
Delaware-Caddo	24	13	11	24	13	11	1	1	1
Wichita-Shawnee	23	1	2	3	1	2	1	1	1
Wichita-Caddo	346	163	183	330	155	175	5	4	7
Wichita-Delaware	1	1	1	1	1	1	1	1	1
Wichita-Caddo	2	1	1	2	1	1	1	1	1
Osage Agency and Reservation—	3,556	1,917	1,739	1,978	1,045	933	6	2	3
Osage-Bannock	3,392	1,741	1,651	1,853	987	866	4	2	2
Osage-Blackfeet	2	2	2	2	2	2	1	1	1
Osage-Cayuse	4	2	2	2	1	1	1	1	1
Osage-Cherokee	21	7	14	16	5	11	5	2	3
Osage-Chippewa	3	2	1	1	1	1	2	1	1
Osage-Chippewa-Wyandotte	4	2	2	1	1	1	4	2	2
Osage-Creek	2	1	1	1	1	1	1	1	1
Osage-Iowa	2	1	1	2	1	1	1	1	1
Osage-Kaw	9	5	4	4	3	1	5	2	3
Osage-National	3	3	3	3	3	3	2	1	2
Osage-Omaha	14	6	9	12	5	7	1	1	1
Osage-Otoe	6	3	3	5	2	3	2	1	1
Osage-Pawnee	2	1	1	2	1	1	1	1	1
Osage-Peoria	1	1	1	1	1	1	1	1	1
Osage-Ponca	4	3	1	4	3	1	1	1	1
Osage-Potawatomi	19	8	11	19	8	11	1	1	1
Osage-Pueblo	19	12	7	17	10	7	2	2	2
Osage-Quiapaw	15	9	6	13	9	4	1	1	1
Osage-Quaipaw-Munsee	2	2	2	2	2	2	2	1	1
Osage-Sac and Fox	4	4	2	2	2	2	2	2	2
Osage-Seneca	3	2	1	3	2	1	1	1	1
Osage-Shawnee	3	3	3	3	2	1	1	1	1
Osage-Sioux	13	3	10	10	2	8	3	1	2
Osage-Wyandotte	1	1	1	1	1	1	1	1	1
Kaw Reservation—	1,501	1,470	2,358	1,706	1,152	192	97	421	198
Kaw	515	272	243	293	159	134	46	22	24
Kaw-Cherokee	6	4	2	202	109	93	36	21	15
Kaw-Cheroenne	1	1	1	2	2	1	1	1	1
Kaw-Chilkasaw	2	1	1	1	1	1	2	1	1
Kaw-Creek	1	1	1	1	1	1	1	1	1
Kaw-Onieda	9	4	5	4	3	1	1	1	1
Kaw-Osage	9	3	6	8	3	5	1	1	1
Kaw-Osage-Potawatomi	2	2	2	2	2	2	1	1	2
Kaw-Ponca	3	3	3	3	3	3	3	3	3
Kaw-Potawatomi	50	49	69	37	32	2	8	1	7
Kaw-Potawatomi-Cherokee	5	3	2	4	2	1	1	1	1
Kaw-Shawnee	6	4	3	1	1	1	1	1	1

Table 2. Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

For footnotes see p. 114.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population						Residing at jurisdiction where enrolled						Residing at another jurisdiction						Residing elsewhere			
	Total			Male		Female	Sex not reported			Total		Male		Female	Sex not reported			Total		Male		
	Total	Male	Female																			
Oklahoma—Continued.																						
Quapaw Agency—Continued.																						
Quapaw Reservation (Quapaw)	528	253	275							309	148								209	100	109	
Seneca Reservation (Seneca)	680	338	342							357	177								203	105	98	
Wyandotte Reservation (Wyandotte)	700	342	358							287	150								349	162	187	
Shawnee Agency	4,435	2,249	2,186							2,700	1,408								1,733	841	893	
Iowa Reservation (Iowa)	107	51	56							106	61								1	1	1	
Kickapoo Reservation (Kickapoo)	212	112	100							199	94								13	7	6	
Potawatomi Reservation (Potawatomi)	2,633	1,354	1,329							1,164	608								1,515	746	772	
Sac and Fox Reservation (Sac and Fox)	822	415	407							672	351								150	64	86	
Shawnee Reservation (Shawnee)	611	317	311							559	293								52	24	28	
Oregon—Continued.	4,609	2,347	2,362							3,682	1,832								630	253	371	
Klamath Agency and Reservation	1,349	650	699							1,045	521								253	105	154	
Chocoy-Klamath	4	2	2							4	2											
Hoopa-Klamath-Pit River	1	1	1							1	1											
Klamath	405	193	212							288	146								117	47	70	
Cree	1	1	1																1	1	2	
Klamath-Willewah	7	3	4							4	2								3	1	1	
Klamath-Willewah Pit River	1	1	1							1	1											
Klamath-Iroquois	1	1	1							1	1											
Klamath-Klikitat	1	1	1							1	1											
Klamath-Klikitat-Nisqually-Pit River	191	96	95							183	96								87	8	8	
Klamath-Modoc	1	1	1							1	1											
Klamath-Modoc-Cherokee	12	4	8							23	12							8				
Klamath-Modoc-Molala	41	18	18							41	18							23				
Klamath-Modoc-Pit River	1	1	1							1	1							1				
Klamath-Modoc-Seminole	1	1	1							1	1							1				
Klamath-Molala	22	12	12							10	9							19	10	9	1	
Klamath-Palute	12	4	8							11	8							11	3	8		
Klamath-Pima-Papago	7	4	3							7	4							7	4	3		
Klamath-Pit River-Paiute	5	1	4							9	5							15	7	8		
Klamath-Shasta	23	9	14							14	15							1	1	1		
Klamath-Siou	1	1	1							1	1							1	1	1		
Klamath-Umpqua	3	2	1							2	1							3	2	1		
Klamath-Umpqua-Pit River	3	2	1							2	1							3	2	1		
Klamath-Wasco	9	6	6							6	9							9	6	3		
Klamath-Yaqui	3	3	3							3	3							3	3	3		

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1883—Continued

Joshua	19	8	11	9	1	1	3	1	2
Joshua-Cheico									
Joshua-Clatsop									
Joshua-Dakubetede									
Joshua-Plegan									
Joshua-Smith River									
Klamath	48	32	16	44	20	15			
Klamath-Rogue River									
Klikitat	4	2	2	2	1	1			
Kusa	9	4	2	5	8	4			
Kusa-Chasta-coosta									
Kwataami	11	8	3	10	8	2			
Kwataami-Umpqua									
Meguenodon	35	21	14	30	19	11			
Meguenodon-Hop-a									
Meguenodon-Kusa	2	1	5	7	2	1			
Meguenodon-Shasta									
Meguenodon-Yuchi	7	1	7	7	7	7			
Naltunne-tune	5	3	2	1	1				
Naltunne-tune-Kusa									
Rogue River	51	28	23	47	26	21			
Salmon River	1	1	1	1	1	1			
Salmon River-Meguenodon									
Shasta	2	2	2	2	2	2			
Shasta-Ohasta-coosta									
Smith River	6	5	1	6	5	1			
Tillamook	4	2	2	1	1	1			
Tutuni	45	17	28	45	17	28			
Tutunne-Chetto									
Umpqua	14	6	8	14	6	8			
Yacquina	12	2	2	2	2	2			
Yacquina-Alsea									
Yuchi	3	2	1	3	2	1			
Unknown	6	1	5	6	1	5			
Fourth Section Allottees (Public Domain)									
Calañooya	327	172	165	311	164	147	8	7	1
Cherokee									
Cowlitz	17	11	6	17	11	6			
Cowlitz-Klamath									
Klamath	1	1	2	1	1	2			
Kusa	4	2	2	4	2	2			
Mission									
Rogue River	51	25	26	43	21	22			
Rogue River-Mission									
Siuslaw	59	27	32	58	26	32	3	3	4
Spokane							1	1	1
Tutuni	68	37	31	67	37	30			
Tutuni-Kusa									
Yachina	3	1	2	3	1	1			
Yachina-Alsea									
Yuchi	10	7	3	10	7	3			
	17	6	11	17	6	11	1	1	1

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

Warm Springs Agency and Reservation									
Umatilla-Yakima	7	8	14	6	8	1	1	205	86
Walla Walla	262	263	273	147	126	47	29	18	2
Walla Walla-Calapooya	2	2	3	1	2	12	6	9	7
Walla Walla-Cherokee	3	1	8	7	1	2	2	1	1
Walla Walla-Cowlitz	29	15	14	1	1	1	1	1	1
Walla Walla-Flathead	4	3	1	2	3	1	2	2	3
Walla Walla-Klikitat	3	1	1	2	2	2	1	1	1
Walla Walla-Nez Perce	4	3	1	1	1	1	1	1	1
Walla Walla-Nez Perce-Flathead	1	1	1	1	1	1	1	1	1
Walla Walla-Paloos	8	4	4	7	4	3	1	1	1
Walla Walla-Sloux	5	3	2	5	3	9	9	5	2
Walla Walla-Umatilla	23	11	12	18	9	11	4	2	3
Walla Walla-Yakima	222	9	13	18	7	11	1	2	1
Yakima	1	1	1	1	1	1	1	1	1
<hr/>									
Warm Springs	474	516	538	407	401	79	43	36	24
Cowlitz	3	2	3	1	1	2	1	1	20
Klamath-Pit River-Wasco	5	2	3	1	1	5	2	3	2
Klikitat	27	11	16	26	11	15	1	1	1
Klikitat-Yakima	1	1	1	1	1	1	1	1	1
Paiute	192	103	89	149	77	72	35	20	8
Paiute-Blockfeet	1	1	1	1	1	1	1	1	6
Paiute-Tennio (Warm Springs)	8	4	4	7	4	3	1	1	2
Paiute-Wasco	8	5	3	4	3	1	4	2	2
Paiute-Yakima	4	3	1	4	3	1	1	1	1
Pit River	1	1	1	1	1	1	1	1	1
Pit River-Payallup	9	5	4	4	3	1	1	1	2
Pit River-Payallup-Hoopia	3	1	2	3	1	2	1	1	1
Pit River-Payallup-Paiute	6	4	2	2	6	4	2	2	2
Pit River-Wasco	4	1	3	4	1	3	1	1	1
Pit River-Wasco-Shasta	2	2	2	2	2	2	2	2	2
Pit River-Yakima	2	2	2	2	2	2	2	2	2
Payallup	4	1	3	4	1	3	1	1	1
Payallup-Wasco-Pit River	430	189	250	409	176	238	14	8	6
Tenino (Warm Springs)-Blood	1	1	1	1	1	1	1	1	1
Tenino (Warm Springs)-Klikitat	1	1	1	1	1	1	1	1	1
Tenino (Warm Springs)-Nez Perce-Wasco	1	1	1	1	1	1	1	1	1
Tenino (Warm Springs)-Siletz	1	1	1	1	1	1	1	1	1
Tenino (Warm Springs)-Umatilla	6	4	2	4	3	4	4	5	6
Tenino (Warm Springs)-Upper Chinook	4	4	4	4	3	4	3	2	1
Tenino (Warm Springs)-Wasco-Paiute	4	3	1	4	3	1	1	1	1
Tenino (Warm Springs)-Wasco-Yakima	7	2	5	7	2	5	11	5	6
Tenino (Warm Springs)-Yakima	11	5	6	11	5	1	1	1	1
Upper Chinook	4	2	2	4	2	2	2	2	2
Wasco	99	47	52	75	36	39	8	4	4
Wasco-Payallup	4	3	1	4	3	1	4	4	3
Wasco-Tenino (Warm Springs)-Wasco-Yakima	99	49	50	93	46	47	3	2	1

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1883—Continued

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere			
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington—Continued.																
Tulalip Agency—Continued.																
Tulalip Reservation and Tulalip unattached Indians																
Clallam.	644	313	331	1	444	218	226		8	2	6	192	4	93	99	
Skagit.	4	3	1										1	3	1	
Snohomish.	1	1											1	1		
Snohomish-Clallam.	568	273	295	7	388	191	197	8	2	6	172	80	92			
Snohomish-Larami.	14	7	7		7	3	4						7	4	3	1
Snohomish-Makah.	4	3	1		1		1						4	3	1	
Snohomish-Nooksak.	1	1	2		1	3	2		1							
Snohomish-Pautie.	1	1			1	1										
Snohomish-Puyallup.	6	2	4		6	2	4									
Snohomish-Puyallup-Suquamish.	2	1	1		2	1	1									
Snohomish-Skagit.	5	3	2		5	3	2									
Snohomish-Suquamish.	12	7	5		8	5	3						4	2	2	
Snohomish-Swinomish.	3	2	1		3	2	1									
Snohomish-Yakima.	19	8	11		19	8	11									
Public Domain (Clallam)																
Clallam.	761	389	362	1									261	99	362	
Clallam-Lummi.	744	392	352	1									744	392	352	1
Clallam-Makah.	1	1	2										1	1	2	
Clallam-Puyallup.	1	1											1	1	1	
Clallam-Snohomish.	3	2	1										3	2	1	
Clallam-Suquamish.	9	4	5										9	4	5	
Public Domain (Nooksak)																
Nooksak.	207	110	97		202	107	95						6	3	2	
Nooksak-Skagit.	205	110	96	2	200	107	93	2	4	2	2		5	3	2	
Skagit.	206	116	90	1	198	112	86	1	1	1	1		4	2	2	
Skagit-Makah.	200	111	89	1	195	109	86	1	3	2	1		1	1	2	
Yakima Agency and Reservation (Yakima)																
Yakima.	2,924	1,383	1,541	3	2,384	1,129	1,255	42	17	17	17		498	237	261	

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Wisconsin¹¹	Hayward School Jurisdiction and Lac Courte Oreille Reservation (Chippewa)	11,139	5,615	5,524	9,132	4,644	4,488	373	171	202	1,634	800	834
Menominee-Keshena Agency ¹¹	1,538	760	778	1,454	717	737	4	197	85	112	80	39	41
Menominee Reservation	5,101	2,581	2,550	4,080	2,117	1,973	197	19	7	12	814	379	435
Menominee-Chippewa	2,023	935	1,028	1,894	916	978	823	14	7	10	110	43	67
Menominee-Oreok	1,820	929	891	1,715	892	821	18	3	1	2	1	33	58
Menominee-Onida	43	22	21	39	31	21	18	3	1	2	1	1	1
Menominee-Onida-Chippewa	3	1	2	3	3	1	2	16	16	16	16	16	16
Menominee-Ottawa	37	21	16	37	21	21	16	16	16	16	16	16	16
Menominee-Ottawa-Potawatomi	4	1	3	4	1	1	1	1	1	1	1	1	1
Menominee-Potawatomi	13	7	6	13	7	6	6	6	6	6	6	6	6
Menominee-Shawnee	30	15	15	2	3	1	2	2	2	2	2	2	2
Menominee-Sioux	5	1	1	1	5	1	4	4	4	4	4	4	4
Menominee-Sioux-Winnebago	1	1	1	1	1	1	1	1	1	1	1	1	1
Menominee-Stockbridge	48	24	24	34	14	20	20	20	20	20	20	20	20
Menominee-Winnebago-Chippewa	13	6	6	9	4	5	5	5	5	5	5	5	5
Menominee-Wyandotte	1	1	1	1	1	1	1	1	1	1	1	1	1
Oneida Reservation	3,078	1,553	1,525	2,196	1,139	1,057	178	78	100	704	336	365	
Oneida-Brothertown	2,947	1,493	1,454	2,136	1,115	1,021	145	61	84	666	317	349	
Oneida-Cherokeee	2	7	7	14	6	6	6	6	6	15	7	8	
Oneida-Chippewa	34	19	15	9	6	3	3	3	3	3	3	3	
Oneida-Chocaw	3	2	1	2	1	1	1	1	1	1	1	1	
Oneida-Klamath	2	1	1	1	1	1	1	1	1	1	1	1	
Oneida-Menominee	5	3	2	5	3	3	2	2	2	2	2	2	
Oneida-Mohawk	5	3	2	5	3	3	3	3	3	3	3	3	
Oneida-Omaha	1	1	1	1	1	1	1	1	1	1	1	1	
Oneida-Pima	2	1	1	1	1	1	1	1	1	1	1	1	
Oneida-Ponca	1	1	1	1	1	1	1	1	1	1	1	1	
Oneida-Pueblo	4	3	1	2	1	1	1	1	1	1	1	1	
Oneida-Sioux	3	1	2	1	1	1	1	1	1	1	1	1	
Oneida-Stockbridge	35	12	23	35	12	23	23	23	23	23	23	23	
Lac du Flambeau Agency¹¹	3,093	1,575	1,518	2,397	1,244	1,183	36	11	7	4	2	2	2
Bad River Reservation (Chippewa)	1,211	627	584	733	383	350	27	16	11	11	451	339	321
Lac du Flambeau Reservation (Chippewa)	849	399	450	757	353	404	92	92	92	92	228	223	
Red Cliff Reservation (Chippewa)	607	316	426	491	252	239	190	9	6	6	64	46	46
Scattered bands	426	233	193	416	226	217	176	9	6	3	116	64	52
Potawatomi	403	224	179	393	217	217	217	217	217	217	217	217	217
Potawatomi-Chippewa	2	2	2	2	2	2	2	2	2	2	2	2	2
Potawatomi-Ottawa	9	6	3	9	6	3	3	3	3	3	3	3	3
Potawatomi-Winnebago	12	3	9	12	3	9	9	9	9	9	9	9	9
Tomah School Jurisdiction and Public Domain Allotments (Winnebago)	1,407	699	708	1,191	596	595	136	60	76	80	43	37	

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere				
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female	Total	Male	Female
Wyoming																	
Shoshone Agency and Wind River or Shoshone Reservation	2,115	1,090	1,025	—	1,881	983	898	—	50	26	24	184	81	103	—	—	—
Arapaho	2,115	1,090	1,025	—	1,881	983	898	—	50	26	24	184	81	103	—	—	—
Arapaho-Gros Ventre	1,024	531	493	—	984	513	471	—	13	7	6	27	11	16	—	—	—
Arapaho-Shoshone	5	3	2	—	5	3	2	—	—	—	—	4	2	2	—	—	—
Arapaho-Sioux	4	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shoshone	3	1	2	—	3	1	2	—	—	—	—	—	—	—	—	—	—
Shoshone-Arapaho	1,030	523	507	—	861	449	412	—	33	16	17	136	58	78	—	—	—
Shoshone-Bannock	9	5	4	—	6	3	3	—	—	—	—	2	1	1	—	—	—
Shoshone-Comanche	7	2	2	—	6	4	2	—	1	1	—	—	—	—	—	—	—
Shoshone-Flathead	3	2	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Shoshone-Navajo	5	2	3	—	3	1	2	—	2	1	1	—	3	2	1	—	—
Shoshone-Paiute	7	4	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shoshone-Seminole-Wyandotte	3	2	1	—	3	—	—	—	—	—	—	—	3	2	1	—	—
Shoshone-Ute	3	2	1	—	10	7	3	—	—	—	—	—	—	—	2	1	1
Shoshone-Yakima	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—

¹ See estimated statement of other Indians not enumerated numbering 88,700.² Formerly the entire population of Southern Navajo Agency was reported under Arizona, which accounts for the large decrease in the population of Arizona and the unusual increase in New Mexico.³ Apr. 1, 1932, population.⁴ Apr. 1, 1930, population.⁵ Tulare County Indians prior to 1932 returned under Tule River Reservation.⁶ Apr. 1, 1931, population.⁷ Exclusive of Five Civilized Tribes. (See estimated statement.)⁸ Over 600 additional Indians were enrolled during the year at Quinault Reservation, Taholah Agency, hence the unusual increase in population.⁹ Exclusive of scattered bands under Taholah Agency. (See estimated statement.)¹⁰ Some of the Indians formerly enrolled on the Chehalis Reservation are now enrolled on the Quinalt Reservation.¹¹ Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Lac du Flambeau Agency. (See estimated statement.)

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Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933

[Note.—In column 12 are included a considerable number of children believed to be in public schools away from reservations. Column 13 includes eligibles. The figure given in column 2 for Navajos under the Hopi Agency is an estimate based on the proportion of children to total population in other Arizona Navajo jurisdictions.]

State and jurisdiction	Indian children 6 to 18 years, inclusive	Enrollment, 6 to 18 years of age						Under 6 and over 18 years enrolled in all schools			6 to 18 years of age		
		Total number	In local public	In Fed- eral day	In Fed- eral non- reser- vation boarding	In Fed- eral reser- vation boarding	In mis- sion, pri- vate and State day	In mis- sion, pri- vate and State day boarding	In san- atoria	Definite information not available	Not en- rolled in any school		
		1	2	3	4	5	6	7	8	9	10	11	12	13
Total		100,678	76,096	43,988	6,315	9,805	7,426	1,764	6,200	598	2,749	12,520	12,062
Arizona		15,258	8,325	559	1,353	2,386	1,650	806	900	71	606	4,131	2,802
Colorado River.		71	69	40	—	20	9	—	—	—	2	—	2
Chemeheuevi.		195	186	65	—	84	32	—	4	—	12	—	3
Mohave.		837	739	26	62	396	56	141	45	13	73	6	98
Havasupai.		58	36	—	38	12	6	—	—	—	—	—	2
Hopi:		745	722	48	402	1	240	—	31	—	49	—	23
Navajo.		1,400	400	1	—	220	176	—	3	—	9	—	1,000
Kaiab (under Paiute)		26	21	3	—	13	5	—	—	—	—	—	5
Leupp.		669	388	13	—	319	54	—	2	—	39	—	281
Phoenix;		100	56	29	—	18	—	7	—	1	—	6	—
Camp Verde.		395	311	51	148	2	79	—	20	1	11	50	18
Salt River.		1,469	1,009	39	585	—	114	78	168	25	82	460	84
Pima.		696	522	2	204	107	23	161	25	—	—	—	174
San Carlos.		1,568	1,021	62	320	24	127	354	134	—	—	547	—
Sells.		5,174	2,074	166	126	760	474	65	466	8	—	—	—
Southern Navajo.		110	99	3	—	84	11	—	1	—	205	3,100	11
Truxton Canon.		118	118	4	55	—	59	—	—	—	—	—	—
Western Navajo:		1,627	534	7	—	330	185	—	—	—	—	—	—
Hopi.		4,609	4,091	3,100	303	98	513	4	57	12	76	—	1,083
■ Navajo		404	318	244	6	—	68	—	—	—	237	124	394
Bishop (under Walker River, Nev.)		196	160	16	114	—	28	—	—	—	45	61	25
Fort Yuma.		1,261	1,081	862	68	—	147	—	—	—	18	—	36
Hoopa Valley.		683	604	354	93	36	—	—	2	51	4	24	12
Mission.		2,005	1,928	1,624	22	—	270	—	—	—	37	—	76
Colorado: Consolidated Ute.		192	151	64	—	68	15	—	6	6	103	51	86
Florida: Seminole.		175	14	—	—	—	—	—	3	1	12	1	40

Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933—Continued

State and jurisdiction	Indian children 6 to 18 years, inclusive	Enrollment, 6 to 18 years of age						Enrollment, 6 to 18 years of age					
		Total number	In local public	In Fed- eral day	In Fed- eral reser- vation boarding	In Fed- eral non- reserva- tion boarding	In mis- sion, pri- vate and State day	In mis- sion, pri- vate and State board- ing	Under 6 and over 18 years enrolled in all schools	Definite information not avail- able	Not en- rolled in any school	6 to 18 years of age	
1	2	3	4	5	6	7	8	9	10	11	12	13	
Idaho.													
Coeur d'Alene	1,103	868	407	244	80	1	132	4	17	83	152		
Fort Hall	248	209	102	244	13	1	89	4	17	17	39		
Fort Lawai	533	420	139	37	30							113	
Iowa: Sac and Fox													
Kansas	322	239	166	62	21							83	
Sac and Fox	121	98	18	17	78	1	7	10	10	217	14	(1)	9
Potawatomi	558	252	152	17	52							217	89
Iowa	19	4	2										
Kickapoo	248	164	102	5	52	1	4					37	47
Minnesota:													
Consolidated Chippewa	4,657	4,223	2,990	12	311								
Pipstone	4,088	3,724	2,835	70	501	260	31	77	77			288	146
Red Lake	100	92	79	24	511	255	29	50	50			246	118
Mississippi: Choctaw													
Blackfeet	562	302	76	287	9	5	2	27	27			42	8
Crow	4,531	3,968	2,882	195	345	406	38	6	6			35	225
Flathead	1,255	1,057	698	33	132	322	80	214	214			111	452
Fort Belknap	550	664	469	40	40	72	20						198
Fort Peck	957	805	517	2	102	136	2	20					26
Rocky Boy's	397	329	158	6	16	53	1	41					115
Tongue River	705	658	3,588	2	40	21	9	17					40
Nebraska:													
Santee (under Yankton, S. Dak.)	1,435	985	625	71	19	5							
Ponca	356	290	114	200	43	104	6	6	6			33	36
Winnebago	148	65	38	17	17	62	27	70	70			316	134
Omaha	385	298	210	46	46	28	14	35	35			57	20
Carson	546	413	263	2	100	35	13	20	20			73	60
Moapa River (under Paiute, Utah)	1,285	1,006	513	164	151	1	24	53	53			2	227
Walker River	558	428	265	45	114	1	3	3	3			1	129
Mason-Smith Valleys	40	33	17			16							
Scattered Indians	109	93	30	28		35						7	7
Fallon	104	87	9	41		37						16	16
	92	61	18	1		42						1	30
	97	76				35						1	21

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Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933—Continued

State and jurisdiction	Enrollment, 6 to 18 years of age						Under 6 and over 18 years enrolled in all schools						Not enrolled in any school	
	Indian children 6 to 18 years, inclusive			In local public			In Federal day			In Federal non-reservation boarding				
	Total number	3	4	5	6	7	8	9	10	11	12	13		
Utah	455	352	83	64	157	44	2	2	30	43	60	60		
Uintah and Ouray	332	263	64	18	154	23	2	2	29	41	28	28		
Paiute:														
Goshute	42	37		33		4							4	
Shirwits	25	21	6		16								3	
Skull Valley	13	12		11	1	1							1	
Scattered Bands														
Allen Canyon (under Consolidated Ute)	29	15	13	1	1								14	
Washington	2,946	2,490	1,951		6	174		203	156	35	196	260		
Colville:														
Spokane	584	450	299				26	123	2		83	51		
Colville	120	84	73				11	12	6		6	32		
Neah Bay													1	
Taholah	284	246	191				21	2		32		33		
Trilabil	1,047	912	750				66	15	81			134		
Yakima	648	567	425				6	51	35	29		9		
Wisconsin	2,300	1,633	1,388	132	186	129	266	515	17	60	386	281		
Hayward	446	316	163	70	74	70	74	74			55	75		
Keshena	570	546	32	22	104	4	87	288	9	51	1	23		
Lac du Flambeau														
Lac du Flambeau	223	179	40	110			26	2	1	5	9	35		
Red Cliff	157	75	3				65				61	21		
Crandon	153	91	70		3		10	3	5	1	14	48		
Bad River	322	186	42				28	114	2		103	33		
Tomah	420	240	38				54	148		3	143	46		
Wyoming	649	588	160				125	31		272	14	1	60	
Shoshone:											9	26		
Shoshone	327	301	136				113	21		31				
Arapaho	322	287	24				12	10		241	5	34		

¹ 1932 figures.² All children above fourth grade attend public school.³ 148 of this number are housed in dormitory. The total scholastic population is taken from the State enumeration and is not inclusive of all Indian children of the Five Civilized Tribes. The enrollment figures include children who are under 6 and over 18 years of age. The Indian pupils reported as in public schools include only those for whom tuition was paid, and do not include children enrolled in public schools in incorporated towns; these children are shown under column 12. The supervisor of Indian education in Oklahoma estimates that there were 4,406 Five Civilized Tribes children enrolled in incorporated towns in 1932-33.⁴ 109 additional children housed in dormitories but attend public school and counted in column 4.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Total.	29,062	25,147		
Arizona:				
Colorado River Agency:				
Colorado River	95	93	B-6	Reservation, boarding.
Fort Apache Agency:				
Fort Apache	439	427	B-8	Do.
Canyon	35	33	B-2	Day.
Cibicue	33	30	B-2	Do.
Havasupai Agency:				
Havasupai	40	38	B-7	Do.
Hopi Agency:				
Hopi	172	167	B-7	Reservation, boarding.
Chimopovy	68	66	B-6	Day.
Hotevilla-Bacabi	93	88	B-7	Do.
Oraibi	70	65	B-7	Do.
Polacca	125	115	B-7	Do.
Second Mesa	65	57	B-6	Do.
Leupp Agency:				
Leupp	407	386	B-8	Reservation, boarding.
Phoenix School:				
Phoenix	860	752	6-12	Nonreservation, boarding.
Salt River	143	121	B-5	Day.
Pima Agency:				
Pima	241	175	1-9	Do.
Blackwater	41	33	B-2	Do.
Casa Blanca	100	81	B-6	Do.
Chui Chiuschu	20	13	B-3	Do.
Gila Crossing	72	56	B-5	Do.
Maricopa	26	25	B-4	Do.
Santan	122	90	B-5	Do.
San Carlos Agency:				
San Carlos	200	183	B-6	Reservation, boarding.
San Carlos	69	58	B-6	Day.
Sells Agency:				
Poso Redondo	37	19	B-3	Do.
Santa Rosa	129	93	B-4	Do.
San Xavier	91	77	B-5	Do.
Sells-Vamori	80	63	B-5	Do.
Ventena	57	40	B-6	Do.
Southern Navajo Agency:				
Chin Lee	152	135	B-5	Reservation, boarding.
Southern Navajo	435	404	B-7	Do.
Tohatchi	240	229	B-5	Do.
Cornfields	33	31	B-2	Day.
Crystal	32	25	B-2	Do.
Kinlichee	34	33	B-1	Do.
Klagetoh	35	33	B	Do.
Theodore Roosevelt School	416	389	B-9	Nonreservation, boarding.
Truxton Canon School	208	206	B-8	Reservation, boarding.
Western Navajo Agency:				
Western Navajo	339	329	B-7	Do.
Moencopi	55	54	B-4	Day.
California:				
Fort Yuma Agency:				
Fort Yuma	154	120	B-7	Do.
Hoopa Valley Agency:				
Hoopa Valley	95	82	B-6	Do.
Mission Agency:				
Campo	17	14	B-5	Do.
Mesa Grande	16	15	B-4	Do.
Pala	17	14	B-3	Do.
Rincon	30	27	B-6	Do.
Volcan	27	22	B-4	Do.
Sacramento Agency:				
Fort Bidwell	21	16	B-8	Do.
Sherman Institute	1,015	898	6-12	Nonreservation, boarding.
Colorado:				
Consolidated Ute Agency:				
Ignacio	225	216	B-8	Reservation, boarding.
Ute Mountain	167	160	B-8	Do.
Florida:				
Seminole Agency:				
Seminole	20	7	B-6	Day.
Idaho:				
Fort Hall Agency:				
Fort Hall	236	225	B-8	Reservation, boarding.
Iowa:				
Sac and Fox Agency:				
Mesquakie	57	42	B-4	Day.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Kansas:				
Haskell Agency:				
Haskell Institute.....	972	823	9-12	Nonreservation, boarding.
Kickapoo.....	21	18	B-8	Day.
Michigan:				
Mount Pleasant School.....	448	351	1-9	Nonreservation, boarding.
Minnesota:				
Consolidated Chippewa Agency:				
Pine Point.....	83	60	B-6	Day.
Pipestone School.....	357	328	B-9	Nonreservation, boarding.
Red Lake Agency:				
Cross Lake.....	107	103	B-7	Reservation, boarding.
Red Lake.....	144	120	B-8	Do.
Mississippi:				
Choctaw Agency:				
Bogue Chitto.....	25	22	B-3	Day.
Bogue Homo.....	25	18	B-6	Do.
Conehatta.....	68	47	B-5	Do.
Pearl River.....	81	64	B-6	Do.
Red Water.....	48	42	B-6	Do.
Standing Pine.....	34	29	B-5	Do.
Tucker.....	62	52	B-6	Do.
Montana:				
Blackfeet Agency:				
Blackfeet.....	198	151	1-10	Reservation, boarding.
Heart Butte.....	39	27	B-3	Day.
Fort Belknap Agency:				
Fort Belknap.....	168	128	1-9	Reservation, boarding.
Fort Peck Agency:				
Fort Peck.....	148	114	B-12	Do.
Rocky Boy's Agency:				
Haystack Butte.....	25	22	B-6	Day.
Parker Canyon.....	22	19	B-5	Do.
Rocky Boy's.....	43	31	B-8	Do.
Sangrey.....	31	23	B-6	Do.
Tongue River Agency:				
Tongue River.....	73	71	B-6	Reservation, boarding.
Birney.....	41	38	B-5	Day.
Nebraska:				
Genoa School.....	560	481	2-12	Nonreservation, boarding.
Nevada:				
Carson Agency:				
Carson.....	637	556	B-10	Do.
Fort McDermitt.....	48	40	1-6	Day.
Pyramid Lake Agency:				
Nevada.....	59	52	B-7	Do.
Walker River Agency:				
Fallon.....	34	25	B-3	Do.
Walker River.....	54	36	B-7	Do.
New Mexico:				
Albuquerque School.....	926	881	7-12	Nonreservation, boarding.
Charles H. Burke.....	660	560	2-12	Do.
Eastern Navajo Agency:				
Eastern Navajo (Pueblo Bonito).....	413	365	B-6	Reservation, boarding.
Pinedale.....	30	26	B-3	Day.
Mescalero Agency:				
Mescalero.....	112	110	B-6	Reservation, boarding.
Northern Navajo Agency:				
San Juan.....	413	403	B-7	Do.
Toadlena.....	247	228	B-7	Do.
Navajo.....	58	45	B-4	Day.
Redrock.....	50	31	B-3	Do.
Saynottie.....	38	25	B-2	Do.
Teeconospos.....	22	20	B	Do.
Santa Fe Agency:				
Santa Fe.....	647	563	1-11	Nonreservation, boarding.
Picuris.....	21	20	B-3	Day.
San Ildefonso.....	14	13	B-4	Do.
San Juan.....	80	75	B-6	Do.
Santa Clara.....	50	45	B-5	Do.
Taos.....	153	146	B-7	Do.
Tesuque.....	12	10	B-4	Do.
Southern Pueblos Agency:				
Acomita.....	87	75	B-6	Do.
Chicale.....	25	22	B-6	Do.
Cochiti.....	37	34	B-5	Do.
Encinal.....	22	21	B-6	Do.
Isleta.....	91	83	B-6	Do.
Jemez Mission.....	37	34	2-3	Do.
Jemez.....	63	52	3-4	Do.
Laguna.....	47	46	B-6	Do.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Southern Pueblos Agency—Continued.				
McCarty's	70	65	B-8	Day.
Mesita	20	17	B-6	Do.
Paguate	77	66	B-6	Do.
Paraje	33	30	B-5	Do.
Sandia	19	19	B-4	Do.
San Felipe	60	53	B-6	Do.
Santa Ana	25	23	B-6	Do.
Santo Domingo	111	95	B-5	Do.
Seama	32	27	B-6	Do.
Sia	13	13	B-4	Do.
Zuni Agency:				
Zuni	131	122	B-8	Do.
North Carolina:				
Cherokee Agency:				
Cherokee	375	336	B-9	Reservation, boarding.
Cherokee	103	65	B-9	Day.
Big Cove	19	16	B-4	Do.
Birdtown	65	46	B-6	Do.
North Dakota:				
Bismarck School	134	122	1-9	Nonreservation, boarding.
Fort Berthold Agency:				
Independence	25	19	B-3	Day.
Shell Creek	44	25	B-6	Do.
Fort Totten School	296	268	1-9	Reservation, boarding.
Standing Rock Agency:				
Standing Rock	253	224	1-8	Do.
Turtle Mountain Agency:				
Turtle Mountain	581	391	1-8	Day.
Indian Day No. 5	81	40	B-6	Do.
Wahpeton School	369	336	B-9	Nonreservation, boarding.
Oklahoma:				
Cheyenne and Arapaho Agency:				
Cheyenne and Arapaho	262	216	1-9	Reservation, boarding.
Chilocco School	1,062	857	6-12	Nonreservation, boarding.
Kiowa Agency:				
Anadarko	165	130	B-6	Reservation, boarding.
Fort Sill	225	203	1-9	Do.
Riverside	278	214	1-7	Do.
Pawnee Agency:				
Pawnee	350	302	1-10	Do.
Quapaw Agency:				
Seneca	267	254	1-9	Do.
Five Civilized Tribes Agency:				
Sequoyah Orphan Training School	365	341	1-11	Nonreservation, boarding.
Creek Nation:				
Euchee	137	111	B-9	Do.
Eufaula	161	150	B-9	Do.
Chickasaw Nation:				
Carter Seminary	202	170	1-9	Do.
Choctaw Nation:				
Jones Male Academy	204	179	1-9	Do.
Wheeler Academy	145	130	B-9	Do.
Oregon:				
Salem School	848	752	7-12	Do.
Warm Springs Agency:				
Warm Springs	136	127	B-8	Reservation, boarding.
Burns	29	28	B-6	Day.
South Dakota:				
Cheyenne River Agency:				
Cheyenne River	236	204	B-8	Reservation, boarding.
Cherry Creek	33	23	B-5	Day.
Green Grass	22	19	B-6	Do.
Thunder Butte	21	17	B-6	Do.
Flandreau School	482	428	9-12	Nonreservation, boarding.
Pierre School	239	307	1-9	Do.
Pine Ridge Agency:				
Pine Ridge (Oglala)	517	439	B-9	Reservation, boarding.
No. 4	23	18	B-6	Day.
No. 5	43	31	B-6	Do.
No. 6	27	18	B-6	Do.
No. 7	33	21	B-6	Do.
No. 9	35	22	B-6	Do.
No. 10	30	14	B-6	Do.
No. 12	22	13	B-6	Do.
No. 15	17	15	B-3	Do.
No. 16	30	21	B-6	Do.
No. 17	16	11	B-5	Do.
No. 19	15	9	B-6	Do.
No. 20	21	13	B-4	Do.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State agency, and school	Enrollment	Average attendance	Grades taught	Class of school
South Dakota—Continued.				
Pine Ridge Agency—Continued.				
No. 21	25	15	B-6	Day.
No. 22	19	15	B-6	Do.
No. 23	25	23	B-6	Do.
No. 24	41	25	B-6	Do.
No. 25	18	16	B-5	Do.
No. 26	16	9	B-6	Do.
No. 27	29	18	B-6	Do.
No. 28	20	13	B-6	Do.
No. 29	22	14	B-6	Do.
Red Shirt Table	22	13	B-6	Do.
Rapid City School	317	279	4-9	Nonreservation, boarding.
Rosebud Agency:				
Rosebud	286	248	B-9	Reservation, boarding.
Blackpipe	30	23	B-6	Day.
Cut Meat	31	21	B-5	Do.
He Dog's Camp	30	22	B-6	Do.
Little Crow	32	23	B-6	Do.
Milk's Camp	32	17	B-6	Do.
Oak Creek	26	23	B-6	Do.
Spring Creek	39	29	B-4	Do.
Upper Cut Meat	27	17	B-6	Do.
Utah:				
Paiute Agency:				
Goshute	46	39	B-7	Do.
Kaibab	15	12	B-6	Do.
Uintah and Ouray Agency:				
Uintah	172	137	B-7	Reservation, boarding.
Ouray	19	17	B-4	Day.
Wisconsin:				
Hayward School	193	164	1-8	Reservation, boarding.
Keshena Agency:				
Keshena	153	139	B-9	Do.
Neopit	37	25	1-8	Day.
Lac du Flambeau Agency:				
Lac du Flambeau	129	106	1-7	Do.
Tomah School	331	312	1-9	Nonreservation, boarding.
Wyoming:				
Shoshone Agency:				
Shoshone	130	104	B-9	Reservation, boarding.

SCHOOL SUMMARY

Class	Number of schools	Enrollment	Average attendance
Total	197	29,062	25,147
Nonreservation, boarding	25	12,594	11,066
Reservation	40	9,632	8,662
Day	132	6,836	5,419

OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS

(ARNO B. CAMMERER, Director)

The resignation on August 9, 1933, of Horace M. Albright, Director of the National Park Service and for over 20 years connected closely with all national-park activities and progress, was a great loss to the Federal Government in national-park work. Conservationists throughout the country as well as high officials of the Federal Government, headed by the President and yourself, expressed deep regret at his decision to resign. Mr. Albright's career in Government service was a brilliant one. Since his appointment as director of the National Park Service in January 1929, the Service expanded in scope and in personnel, particularly in Washington. Outstanding among the new developments during his administration were the establishment of the branch of research and education in the Washington headquarters, the expansion of landscape architectural work, and the establishment of eastern headquarters of both the branch of engineering and the branch of plans and designs.

He was particularly interested in the consolidation of all Federal-park activities and worked out the reorganization plan under which the military parks and monuments and the parks of the National Capital were consolidated with the national park and monument system under the jurisdiction of the National Park Service.

Extension of the landscape architectural activities and development of the 6-year master plans for all national parks received special attention from him. Had not this advance planning been done, the National Park Service would have been unable to take part so quickly and competently in the emergency conservation and public-works program.

The historical program also was developed under Mr. Albright's personal guidance, beginning with the Colonial and George Washington Birthplace National Monuments in Virginia, established in 1930. With the addition of the military areas, which in reality are historical parks, and of the new Morristown National Historical Park in New Jersey, established last July, a definite basis for historical development is available. In addition to the Morristown National Historical Park, 3 national parks and 10 national monuments were established during Mr. Albright's term as director.

Immediately prior to assuming the directorship, he was the first civilian superintendent of Yellowstone National Park, assuming charge in 1919. Under the approximately 10 years during which he retained that position that park made remarkable strides forward in all lines.

Prior to that, Mr. Albright was the first assistant director of the National Park Service and, during the illness of Director Mather at the period of establishment, he actually organized the National Park Service and put it on a working basis, serving as acting director from May 1917 to March 1918. As assistant director (field) during his Yellowstone incumbency he devoted much time to general park problems, particularly to the concession system, and worked out many of the franchises still in operation.

Shortly before he resigned as Director, Mr. Albright had conferred upon him by the American Scenic and Historic Preservation Society the Pugsley gold medal for outstanding conservation work in the field of national parks.

REORGANIZATION UNDER PRESIDENT'S EXECUTIVE ORDER

On June 10 President Roosevelt issued an Executive order which among other consolidations, provided that "All functions of administration of public buildings, reservations, national parks, national monuments, and national cemeteries are consolidated in an Office of National Parks, Buildings, and Reservations in the Department of the Interior, at the head of which shall be a Director of National Parks, Buildings, and Reservations," and that this transfer and consolidation of functions "shall include, among others, those of the National Park Service of the Department of the Interior and the National Cemeteries and Parks of the War Department which are located within the continental limits of the United States." This merger of functions took effect partially on August 10 when officials of the National Park Service became officials of the new Office of National Parks, Buildings, and Reservations, and took over supervision of certain public buildings, the National Capital parks, and the military parks, monuments, certain national cemeteries, and allied reservations, and certain national monuments formerly under the supervision of the Department of Agriculture.

At that time the functions of the Arlington Memorial Bridge Commission, the Office of Public Buildings and Public Parks of the National Capital, the National Memorial Commission, the Public Buildings Commission, and the Rock Creek and Potomac Parkway Commission, in accordance with the Executive commission were transferred to the new organization and the agencies listed abolished.

In that connection the director of the Office of National Parks, Buildings, and Reservations became the vice chairman and executive

officer of the National Capital Park and Planning Commission. He is also a member of the Zoning Commission of the District of Columbia and of various other organizations. Expenditure of funds for the National Capital Park and Planning Commission was taken over by the disbursing officer of the Department of the Interior. The expenditures of the Commission of Fine Arts, the George Rogers Clark Sesquicentennial Commission, and the Rushmore National Commission were also placed under the supervision of the Secretary of the Interior through this Office.

Under the reorganization the former Office of Public Buildings has been separated into two units—the Branch of Public Buildings and a System of National Capital Parks. Final consolidation and reappointment of personnel of the various bureaus under the Office of National Parks, Buildings, and Reservations was postponed by later Executive order until September 30.

Officers of the Office of National Parks, Buildings, and Reservations are convinced that the new organization, comprising as it does a consolidation of all Federal-park activities under one responsible head, will be a smoothly functioning machine that will measure up to the best traditions of the various organizations involved and furnish to the public service of the highest type.

SUMMARY OF ACTIVITIES

As usual, developments during the year were varied and interesting. The consolidation of certain park and buildings operations already has been covered.

Outstanding among the achievements was the operation of 175 citizens civilian conservation summer camps in national parks, national monuments, national military parks, State parks, and other related areas. Approximately 35,000 young men carried on this valuable emergency conservation work. Three hundred winter camps will be operated in these areas.

Congress continued its sympathetic consideration of the needs of the national parks and national monuments. During the busy days of the last session of the Seventy-second Congress and the first session of the Seventy-third Congress, when much legislation of an emergency character required attention, the members of these Congresses took time to pass nine important pieces of legislation involving National Park Service activities, including appropriation measures.

Other measures still pending on House and Senate calendars for possible consideration next session cover the establishment of the Boulder Canyon national reservation in the States of Arizona and Nevada, the establishment of the Everglades national park in Florida, the creation of a national-park trust-fund board to man-

age and invest gifts of funds and property, and the creation of the Saratoga national monument in New York.

Exclusive jurisdiction over the Hot Springs National Park in Arkansas was ceded to the Federal Government by act of the State legislature approved March 25, 1933. Heretofore the Federal Government had been ceded jurisdiction over three separate areas in the park. This newest cession gives exclusive jurisdiction over all lands now or hereafter to be included in the park.

Upon consolidation of the various Governmental functions outlined in the Executive order of June 10, 1933, the Office of National Parks, Buildings, and Reservations took over from the War Department the management of 11 national military parks, 2 national parks, 10 battlefield sites, 10 national monuments, 4 miscellaneous memorials, and 11 national cemeteries.

The Morristown National Historical Park in New Jersey, the first reservation of that designation in the National Park Service, was established July 4, 1933. Additions were made to the Acadia, Carlsbad Caverns, Hot Springs, and Yellowstone National Parks, and the Colonial, Colorado, and Petrified Forest National Monuments. Five new national monuments were established. These are Grand Canyon, White Sands, Death Valley, Black Canyon of the Gunnison, and Cedar Breaks. The Mowich or northwest entrance to Mount Rainier National Park was dedicated on September 2 and a plaque unveiled to Dr. William Fraser Tolmie, the first white man to visit the area. Premier S. F. Tolmie, of British Columbia, was guest of honor at the dedication.

Important among road achievements were the completion and dedication of the Wawona Tunnel and the practical completion of the Wawona Highway in Yosemite National Park, completion and dedication of the Going-to-the-Sun Highway in Glacier National Park, completion of the General Grant unit of the Generals' Highway, and improvement of approach roads to the Southwestern monuments. Noteworthy achievements were made in museum expansion and other phases of the educational work were conducted intensively with reduced personnel. The Division of Wild Life Studies was established as a full-time Government activity. Master development plans were completed for most of the national parks and national monuments under the supervision of the National Park Service before consolidation of the various Federal functions took place. Winter sports use of the national parks continued to gain in popularity.

EMERGENCY CONSERVATION WORK

Officials of the National Park Service have a deep appreciation that they were enabled to assist in carrying out President Roosevelt's emergency conservation program, one of the greatest humanitarian

movements ever conceived for the relief of distress. In addition to its primary purpose of relief, the conservation work accomplished will be of far-reaching importance to the whole country and will build up the health and morale of a large portion of the young manhood of the Nation, fitting them better to be leaders of the future.

Following the passage of the necessary legislation and its approval on March 31, the President appointed Robert Fechner as Director of Emergency Conservation Work and designated as an advisory council to him one representative each from the Department of Labor, the War Department, the Department of Agriculture, and the Department of the Interior. Former Director Albright represented the Interior Department on this board, with the associate director serving as alternate. The present Director now represents the Department.

In addition to the emergency forestation work upon the national parks and national monuments, the National Park Service was charged with the supervision of such work on military parks and monuments, State parks, and 1 or 2 related areas.

As soon as the emergency conservation program received presidential approval, 70 emergency conservation camps were established in national parks and monuments, including the military areas, and 105 on State park and allied lands, making a total of 175 camps thus supervised. The personnel of these camps included 35,000 enrolled men and approximately 2,300 men in supervisory and advisory capacities.

All work within the areas under the jurisdiction of the National Park Service was carefully planned by experienced landscape architects, park engineers, and foresters, and in the historical and military parks historical technicians were employed to insure the careful preservation and interpretation of the historic values. The establishment of emergency conservation camps within these areas, particularly in the national parks, permitted the accomplishment of work that had been needed greatly for years, but which was impossible and would doubtless have continued impossible of accomplishment under the ordinary appropriations available.

Especially has the fire hazard been reduced and the appearance of forest stands greatly improved by clean-up work along many miles of park highways; many acres of unsightly burns have been cleared; miles of fire trails and truck trails have been constructed for the protection of the park forests and excellent work accomplished in insect control and blister-rust control and in other lines of forest protection; improvements have been made in the construction and development of telephone lines, fire lookouts, and guard cabins; and landscaping and erosion control has been undertaken.

An important step in highway beautification is in progress along the highway from Ellsworth to Bar Harbor, Maine, an approach to the

Acadia National Park, by members of the Civilian Conservation Corps under national-park supervision. This was undertaken at the request of the State of Maine, in cooperation with the American Legion of Ellsworth, and includes roadside planting and elimination of unsightly telephone and electric-light poles under scenic easements obtained from property owners. In this connection the State is securing scenic easements to prevent the erection of hot-dog stands and other unsightly structures along the beautiful highway.

At the present time, plans are under way for the inauguration of the second emergency conservation enrollment. It is now anticipated that 56 of the present camps will be discontinued at the end of the first enrollment period and that such men as wish to enroll for the second period will be moved to other locations. Sixty-one camps in the national parks and monuments, including the military parks and monuments, are planned for the winter, and 239 in the State parks and allied areas.

MATHER MEMORIAL PLAQUES

The Stephen T. Mather Appreciation, an organization formed to honor the memory of the first Director of the National Park Service, practically completed its work this year. In all, 18 bronze plaques have been presented to the proper authorities for placement in parks and monuments. Fifteen of these have been fittingly installed and dedicated, many of the ceremonies taking place last year on July 4, Mr. Mather's birthday.

One plaque has been placed in Casa Grande National Monument but not yet dedicated. Another will be located over the fireplace of the administration building in Hawaii National Park. The eighteenth tablet has been delivered to the Superintendent of Acadia National Park, but its location not determined.

On May 27, Mrs. Franklin D. Roosevelt unveiled the plaque placed last year in the Bear Mountain section of the Palisades Interstate Park. The Secretary of the Interior and Horace M. Albright, then Director of the National Park Service, flew from Washington to participate in the ceremony. Secretary Ickes made an address in which he paid a splendid tribute to Mr. Mather's great work for humanity.

The plaque placed in Glacier National Park was dedicated on July 15, the occasion of the formal opening of the Going-to-the-Sun Highway. This great scenic road project was of vital interest to Mr. Mather. Traveling on horseback, he personally located much of the route and selected many of the concentration points affording magnificent panoramas of park scenery. O. S. Warden, Chairman of the Montana State Highway Commission, dedicated the memorial tablet which is along the parkway of Logan Pass.

All of Mr. Mather's friends are deeply grateful to Mr. and Mrs. Franklin Adams of Washington, who have alternately and devotedly acted as secretary of the Appreciation, for their splendid service in perpetuating the memory of our beloved leader and friend.

ENLARGEMENT OF NATIONAL PARK AND MONUMENT SYSTEM

Expansion of the National Park and Monument System under the supervision of the Department of the Interior occurred in three ways during the past year—through the establishment of six additional areas for administration by this Department in accordance with the act establishing the National Park Service, through additions to existing areas, and through the consolidation of functions of several bureaus, already referred to, under which the expanded organization took over the management of 48 areas formerly administered by the War Department.

THE NEW MORRISTOWN NATIONAL HISTORICAL PARK

The first national historical park to be established, as such, was created on July 4, 1933, when the deeds to lands in the Morristown (N.J.) area were accepted on behalf of the United States and formally dedicated to public-park use.

Morristown fittingly was chosen as the first national historical park, since throughout the dark days of the Revolutionary War it served as the base hospital of the Colonial Army and during the winters of 1776-77 and 1779-80 was the main camp site of the American armies. During the period of the war, General Washington spent practically a year in Morristown, counting actual days, and the area is rich in Washingtonia.

It is expected that historical parks in the future will form a definite unit of the National Park and Monument System and the historian forces of this Office now are making a thorough study of outstanding historical events of the Nation, so that a definite program for the establishment of additional parks of this nature may be recommended at a later date.

NEW NATIONAL MONUMENTS

The five national monuments established since the submission of the last annual report are as follows:

Black Canyon of the Gunnison National Monument, Colo., consisting of 11,157.76 acres; established March 2, 1933: This monument takes in 10 miles of the most scenic section of the Black Canyon of the Gunnison River. The section of the canyon included is deep and narrow and its walls expose the interesting geological formation of the region.

Cedar Breaks National Monument, Utah, containing approximately 5,790.05 acres; established August 22, 1933: This area will come under the jurisdiction of the superintendent of Bryce Canyon and Zion National Parks, and with them and the Grand Canyon will tell the story of erosion in the area. Cedar Breaks, formerly a part of the Dixie National Forest, is a series of amphitheaters, eroded to a depth of 2,000 feet in the pink cliff formation at the summit of the plateau. It is an example of the first effects of erosion, Bryce Canyon of the second step, and Zion the third. The Grand Canyon, farther to the south, depicts yet another step in the erosional processes of the Southwest.

Death Valley National Monument, Calif., containing 1,609,800 acres; established February 11, 1933: This monument is the third largest area under the administration of the Office of National Parks, Buildings, and Reservations. In Death Valley, the outstanding desert in the United States and made famous by the early pioneers and prospectors and later by "Death Valley" Scotty, is the lowest point in the United States; and from the mountains which form the eastern boundary of the monument may be seen Mount Whitney, the highest point in continental United States, outside of Alaska.

Grand Canyon National Monument, Ariz., consisting of 273,145 acres and immediately west of and adjacent to the Grand Canyon National Park; established December 22, 1932: From Toroweap Point in this monument may be viewed the inner gorge of the Colorado River, which in the Grand Canyon National Park may be viewed only after a strenuous mule-back ride or hike to the inner gorge. Eventually it is hoped to add the Grand Canyon National Monument to the Grand Canyon National Park.

White Sands National Monument, N.Mex., containing an area of 142,987 acres; established January 18, 1933: With its white sand dunes of almost pure gypsum, it is of great interest from a scientific and geologic standpoint.

ADDITIONS TO EXISTING PARKS AND MONUMENTS

Again during the past year consideration was given to the problem of adjusting boundaries of existing parks and monuments, to simplify administration by providing natural boundaries along topographic lines, and in some cases to include areas of scenic or scientific importance.

These adjustments included:

Acadia National Park, Maine.—The total area of this park was increased to 12,312.11 acres by the donation of 452.79 acres to the Government. Credit is due John D. Rockefeller, Jr., and Superintendent Dorr of the park for this donation.

Carlsbad Caverns National Park, N.Mex.—An area of 9,239.94 acres was added to this park by Presidential proclamation dated February 21, 1933, for administrative and development purposes. The addition of this land makes possible the improvement of the road up Walnut Canyon from the main highway to the caverns' entrance. The total area for the park now is 9,959.16 acres.

Hot Springs National Park, Ark.—Through a re-survey of its old boundaries, 18.79 acres were added to this park, bringing its total area to 945.79 acres.

Yellowstone National Park, Wyo.—By Presidential proclamation dated October 20, 1932, 7,600 acres were added on the north boundary. The new area is an important winter feeding ground for the Yellowstone elk.

Colonial National Monument, Va.—By transfer from the Navy Department, 331.52 acres were added, bringing its total area to 2,707.30 acres.

Colorado National Monument, Colo.—For administrative and development purposes, 3,789.74 acres were added by Presidential proclamation of March 3, 1933, bringing its total area to 17,539.21 acres.

Petrified Forest National Monument, Ariz.—The addition of 53,309 acres in the famous Painted Desert, including the Black Petrified Forest and a parkway between the Petrified Forest and the Painted Desert, more than doubled its area, which now has a total of 90,302.37 acres. The new parkway serves a double purpose in that it gives direct access to the Petrified Forest from Highway U S 66, the main transcontinental highway through the State of Arizona. Enlargement of the forest was the result of exchange agreements reached with the Santa Fe Railroad and private individuals owning lands in the newly added areas.

AREAS TRANSFERRED FROM THE WAR DEPARTMENT

By Executive order of President Roosevelt consolidating certain park and buildings activities, the following reservations under the War Department were transferred, for administration with the national parks and national monuments, to the Department of the Interior:

National military parks: Chickamauga and Chattanooga, Ga. and Tenn.; Fort Donelson, Tenn.; Fredericksburg and Spotsylvania County Battle Fields Memorial, Va.; Gettysburg, Pa.; Guilford Courthouse, N.C.; Kings Mountain, S.C.; Moores Creek, N.C.; Petersburg, Va.; Shiloh, Tenn.; Stones River, Tenn.; and Vicksburg, Miss.

National parks: Abraham Lincoln, Ky.; and Fort McHenry, Md.

Battlefield sites: Antietam, Md.; Appomattox, Va.; Brices Cross Roads, Miss.; Chalmette Monument and Grounds, La.; Cowpens, S.C.; Fort Necessity, Fayette County, Pa.; Kenesaw Monutain, Ga.; Monocacy, Md.; Tupelo, Miss.; and White Plains, N.Y.

National monuments: Big Hole Battlefield, Beaverhead County, Mont.; Cabrillo, Fort Rosecrans, Calif.; Castle Pinckney, Charleston, S.C.; Father Millet Cross, Fort Niagara, N.Y.; Fort Marion, St. Augustine, Fla.; Fort Matanzas, Fla.; Fort Pulaski, Ga.; Meriwether Lewis, Hardin County, Tenn.; Mound City Group, Chillicothe, Ohio; and Statue of Liberty, Fort Wood, N.Y.

Memorials: Camp Blount Tablets, Lincoln County, Tenn.; Kill Devil Hill Monument, Kitty Hawk, N.C.; New Echota Marker, Ga.; and Lee Mansion, Arlington National Cemetery, Va.

Cemeteries: Battleground, D.C.; Antietam (Sharpsburg), Md.; Vicksburg, Miss.; Gettysburg, Pa.; Chattanooga, Tenn.; Fort Donelson (Dover) Tenn.; Shiloh (Pittsburgh Landing) Tenn.; Stones River (Murfreesboro) Tenn.; Fredericksburg, Va.; Poplar Grove, (Petersburg) Va.; and Yorktown, Va. The cemeteries transferred to the jurisdiction of the Department of the Interior included only those within or adjoining the military parks transferred.

As soon as possible after consolidation of functions and personnel is completed under the reorganization, consideration will be given to amalgamating the six classes of reservations thus transferred into the system of parks, national historical parks, and national monuments that has been administered by the National Park Service, with the idea of simplifying the combined areas into a system containing not more than 3 or 4 classes of reservations. Under the present line-up historical parks, military parks, battlefield sites, and some of the national monuments in both systems overlap in their functions and characteristics. It is probable, however, that such changes as are recommended will require Congressional sanction before becoming effective.

PENDING BOUNDARY PROBLEMS

Yellowstone.—No action has been taken by Congress on the report of the Yellowstone Park Boundary Commission of 1929. The report was filed in 1930, the recommendations being in line with those of the 1925 commission. The Commission urged immediate addition of the Bridger Lake and Two Ocean Pass region to Yellowstone Park and agreed that the entire Thorofare-Upper Yellowstone watershed is of national-park caliber. The Forest Service and Park Service have been in agreement on this project since 1918.

Rocky Mountain National Park.—Two important enlargement proposals have been under consideration. One contemplates the addition of the mountain and glacier country south of the park, a region

comprehended in the original park plan. The other attempts to solve the problem of bringing the new Trail Ridge Road to a suitable terminus at the park's headquarters office at the outskirts of the village of Estes' Park. The plan does not require a large acreage. A parkway would more aptly describe the enlargement suggestion. This would vary in width from a hundred feet to perhaps a quarter of a mile. Within this strip of land, the highway would be completed from Moraine Park to Estes Park, and possibly another parkway would bring the Fall River Road to the western edge of the village.

The parkway plans were deferred through local confusion of a school bond question in its application to the acquisition of the parkway lands. Legislation is needed to effectuate all these plans. A proposal to eliminate from the park the lands north of the Mummy Range and including the watershed of the North Fork of the Big Thompson was advanced by certain stock growers, but it was not given favorable consideration by the Service. It required too big a concession of park values especially in timber to the needs of a few individuals.

The Grand Lake addition to the park has been authorized by Congress but was not consummated by Executive proclamation pending completion of plans for the improvement of the Grand Lake Village which, it is hoped, can be revamped into a typical frontier village of log buildings.

Other minor boundary adjustment proposals in the Never Summer Range remain as they were a year ago.

Yosemite National Park.—It is still hoped legislation can be secured to return to the park the lovely Minaret and Devils Post Pile region which was unwisely eliminated in 1904. No progress was made during the year in securing this enlargement of the park. It is one of the worthiest projects in the program of park completion. Opposition to the plan comes from interests who believe it has economic values that should be exploited.

Sequoia National Park.—No action was taken during the year on the proposals to adjust the boundaries of this park to include the Mineral King region lying at the head of the watershed of the East Fork of the Kaweah, every other part of which is in the park.

General Grant National Park.—Minor adjustments of the east and south lines of this park are required for administrative and protective purposes. It ought not to be difficult to solve this line change project, but other more pressing problems held it in abeyance this year.

Kings River Park.—Closely allied with the two park extension projects just described is the old, old plan to give park status to the Middle and South Forks of the Kings River lying north of the Sequoia Park, and for years promoted as an extension of the latter park. More recently the plan has contemplated a new park that would

embrace these two watersheds with their magnificent mountain scenery and also include General Grant Park as an isolated area.

This project was first formulated in the early nineties by the Sierra Club when under the leadership of the great naturalist John Muir. It has given constant attention by Directors Mather and Albright throughout their administrations covering a span of nearly 20 years, but local irrigation interests still feel that their potential water-storage rights cannot be protected in a national park, and they continue to oppose the plan. Meantime the Forest Service has employed landscape architects to study the area with a view to initiating a development of the region which it would seem must inevitably parallel our park system of protection and improvement. It is hardly conceivable that development of the region through application of park policies by another bureau would receive Congressional favor, especially in these days when overlapping of Government functions is being avoided in every possible way.

Grand Teton National Park.—The most important and urgent extension project affects one of our newest but unquestionably one of our greatest national parks. This is the proposal to add to Grand Teton Park a portion of the northern part of the Jackson Hole including more than 30,000 acres of private lands acquired by John D. Rockefeller, Jr., to be granted to the United States, over 40,000 acres of unappropriated public domain, and a tract of national-forest lands including the northern third of the Teton Range, Jackson Lake, and the road to Yellowstone.

Misunderstanding of this project continues and when a Senate inquiry into all its phases was proposed both Mr. Rockefeller and former Director Albright, as well as Secretary Wilbur, welcomed this effort to clarify the issues and impartially ascertain the facts. It is too early to predict what result the committee's study will bring in the way of consummation of one of the finest conservation projects ever conceived. This is a matter of greatest importance to the American people and it must not fail or be seriously curtailed in execution.

Crater Lake National Park.—The Diamond Lake extension to the north is important in the future development of Crater Lake National Park, but no agreement on this has yet been reached with the Forest Service, and the status of this area remains as it was a year ago.

INVESTIGATION OF PROPOSED PARKS AND MONUMENTS

A thorough study of Park Service files during the past year revealed the fact that all told there have been submitted for the consideration of this office proposals for the establishment of 88 national parks and 103 national monuments. It further indicated that 37 of the national-park proposals and 46 of the national monuments had been

investigated and reports made thereon. There still remain on the docket for investigation 51 proposed national-park areas and 57 proposed national monuments.

Three of the park projects investigated have been approved. These are the Guadalupe Mountains in Texas, approved as a desirable addition to the Carlsbad Caverns National Park; the Morristown National Historical Park in New Jersey, established last July; and the proposed Navajo National Park in northern Arizona and southern Utah, to take in part of the Paiute Strip, Navajo Mountain, Rainbow Bridge National Monument, Monument Valley, and the Navajo National Monument. This latter project, covering area in the Navajo Indian Reservation, has been submitted for consideration to the Navajo Tribal Council by the Bureau of Indian Affairs. Should this park be established it is proposed to enter into arrangements similar to those agreed upon when the Canyon de Chelly National Monument in Arizona was established; that is, in establishing the areas as a national park the Indians would not be disturbed by the Government's administration of the area from the standpoint of development, protection, and travel. Furthermore, the Indians would be given preference in the question of employment in connection with improvements in the area. The proposal was considered by the tribal council at its July meeting but was deferred for further consideration at a meeting to be held this fall.

The Guadalupe Mountains area, while already considered as an extension to the Carlsbad Caverns National Park, will be investigated further this winter as to the possibility of establishing a separate national park there.

Of the 46 proposals for the establishment of national monuments investigated, 27 were definitely disapproved. The following 9 were approved: Black Canyon of the Gunnison in Colorado, Cedar Breaks in Utah, Death Valley in California, White Sands in New Mexico, establishment of all four having already been accomplished; and De Soto on the west coast of Florida; Kolob Canyon, just north of Zion National Park in Utah; Palm Canyon in Riverside County, California; and the Painted Desert in Arizona, a portion of which already has been included in the Petrified Forest National Monument.

AUTHORIZED PARK PROJECTS

Although material progress has been made during the year toward the culmination of plans to establish the various eastern national parks approved by Congress, the actual status remains about the same as at the time of the last annual report of the National Park Service.

Great Smoky Mountains National Park.—Commissions of the States of North Carolina and Tennessee have made good progress toward

acquiring lands needed for the completion of the Great Smoky Mountains National Park, but no further deeds have been accepted by the United States. During the month of September representatives of both commissions conferred with representatives of the Office of National Parks, Buildings, and Reservations and formulated plans for acquiring the additional lands needed for park purposes. But three large tracts remain to be acquired in the North Carolina portion. Two of these the commission is arranging to purchase, and the third, covering approximately 33,000 acres, will be considered before a special term of the Superior Court of Buncombe County the latter part of October, as the former award was appealed by both the State and the land owners. There still remain two large tracts to be acquired in the Tennessee portion and 40 scattered small holdings. The Tennessee State Park and Forestry Commission decided to present to the courts, for condemnation, cases concerning all parcels of land in this area on which no agreement regarding the sale price could be reached as soon as funds were available.

Shenandoah National Park.—The Virginia State Conservation Commission hopes to obtain all lands for inclusion in the proposed Shenandoah National Park within the next 6 months. Authority recently was granted by the State legislature for the payment of land-owners within the proposed boundary who are willing to dispose of their holdings, and orders for condemnation proceedings in other cases have been presented to the court for signing. This will expedite the land-acquisition problem. Meanwhile four civilian conservation camps have been established in the proposed park area and work is being continued on the Skyline Drive.

Mammoth Cave National Park.—For the proposed Mammoth Cave National Park, the Kentucky National Park Commission and the Mammoth Cave National Park Association have acquired 38,000 acres including two major caves. The total minimum area of this project is 46,000 acres.

Everglades Project.—Again the question of establishing a national park in the Florida Everglades came up in Congress; again it passed in the Senate and failed in the House of Representatives during the Seventy-second Congress. A Senate act passed during the present congress now is pending in the House and it is hoped that favorable action may be taken there during the next session.

Isle Royale.—There is no progress to report on the Isle Royale project.

COOPERATION OF GOVERNMENTAL AND OTHER AGENCIES

It has always been the policy of the National Park Service to use the scientific and technical personnel and facilities of other Government bureaus wherever possible in the national parks and monu-

ments. During the past year bureaus of the Department of Agriculture, the Treasury Department, the Department of Commerce, the Post Office Department, the Smithsonian Institution, the General Accounting Office, and other bureaus of the Department of the Interior have rendered valuable assistance along the lines of road construction, insect infestation and other forest-disease control, sanitation, archeology, fish culture, accounting, and the expeditious handling of park mail. Special mention should also be made of many cooperating in scientific research.

Generous support also has been given this office by friends outside the Government. As always, the American Civic Association earnestly and vigorously supported park ideals and principles and offered valuable advice in reorganization, legislation, and general planning. A National Parks dinner tendered to the Secretary of the Interior and national-park officials and friends on April 19 gave an opportunity for an interesting discussion of park policies.

The National Parks Association continued to keep in close touch with national-park problems, studying matters of park establishment and enlargement and rendering valuable advice. Other organizations outside of Government circles continuing to be of great assistance were the American Game Protective Association, the Izaak Walton League, the American Forestry Association, the American Nature Association, the Camp Fire Club, the American Bison Society, the Great Smoky Mountains Hiking Club, the Sierra Club, the Potomac Appalachian Trail Club.

PROGRESS IN EDUCATION AND RESEARCH

The past year has presented extraordinary conditions and problems in the field of education and research. The heavily impaired budget made necessary some curtailment of naturalist service throughout the parks and monuments. Particularly unfortunate was the forced reduction in the naturalist personnel, which came in the face of increased demands for this program. What amounted almost to a crisis was produced by the introduction during the summer of the camps of the Civilian Conservation Corps, the educational activities of which required much additional work by naturalists. In certain historical parks, however, notably at Morristown and in the national military parks, this condition has been offset by the addition of historical technicians and historical assistants who have contributed much to permanent historical programs as well as to the emergency conservation work. Everywhere the naturalist service has been taxed to the limit. In the face of these challenges the educational program has met the test in a splendid way, and despite obvious difficulties has been extended in several directions. The work has been stabilized, gains of former years have been consolidated, and the experimental

service in connection with the emergency conservation program inaugurated and developed with more success than at first had been expected.

THE EDUCATIONAL ADVISORY BOARD

The Educational Advisory Board held its annual meeting on February 29, 1933. The theme of conservation, as exemplified in the program of the national parks and monuments, ran through the entire session. The advisory board was particularly helpful in suggesting ways and means of dealing with the rapidly developing historical field, in anticipation of the dedication on July 4, 1933, of the first national historical park, at Morristown, N.J., and of the imminent transfer on August 10, 1933, to the Department of the Interior of the national military parks and other areas of a historical nature previously under the War Department. The effect of this transfer was to make the new Office of National Parks, Buildings, and Reservations the principal Federal agency for historical conservation. Dr. Waldo G. Leland, the member of the board representing historical organizations, and Dr. L. V. Coleman, Director of the American Association of Museums, who was invited to be present and participate in the discussions, each pointed to the awakening interest in the preservation and the interpretation of historic sites, and discussed the development of adequate technique for the proper control and exploitation of such areas. The advisory board expressed an interest in a national program for surveying this problem, the matter being left for development in the hands of Dr. Leland and the chief historian of this office.

TRIPS AFIELD AND CAMPFIRE LECTURES

Public interest in the longer trail trips, especially the all-day hikes, has continued to an extent which has made it difficult to provide adequate supervision for them. For instance, 120 persons appeared one morning recently in Yosemite for the all-day hike. In certain instances during the past summer, park superintendents and naturalists have found it actually necessary to take measures to offset this tendency by encouraging short early morning and evening hikes to places of special interest, as for example, to the botanic gardens in Yosemite. Consequently, moonlight and sunrise hikes became popular in the Yosemite during the latter part of the summer, and can be developed in the other units of the system. A feature hike is that across the floor of Kilauea Crater in Hawaii, "The World's Wierdest Walk." Trips afield are gaining, not losing, in popularity.

Auto-caravan expeditions continue popular, especially in the large western parks, while "sea caravans", where opportunity is afforded to study sea life, and "meteor trips" to the top of Cadillac Mountain for observing meteor showers, are recent innovations greatly enjoyed

by visitors to Acadia National Park. The naturalist at Acadia also enjoys the distinction of being the first member of the educational staff to talk on board a United States battleship, the *Indianapolis*. Thus the educational service has been carried to sea as well as on land.

A game-stalking caravan has developed into a regular feature of the service, especially at Yellowstone. Ranger-naturalists in Lassen Volcanic National Park made daily trips to the top of the volcano. The party starts as an auto caravan, parking the machines at Lake Helen and from there proceeding on foot to the mountain top. The naturalist then stays on top, contacting all those who ascended the peak, while another naturalist is conducting a party to either Bumpas Hell or to the lava tubes, 15 miles outside the park—a trip which attracted hundreds of visitors. Glacier's auto caravan from the Avalanche Camp grounds to Logan Pass on the new transmountain highway, conducted in the same way, was more popular than ever. The trip around the rim of Crater Lake with its many scenic lookout points continues to attract thousands. Everywhere the auto caravan is meeting with growing success.

In connection with the emergency conservation program the naturalists and historians have developed programs designed to give the men in the camps general familiarity with the area of their work and with park administration. Special instruction in forestry, geology, and history has been offered with fine results. In many instances the men have been loaded into Army trucks and hauled long distances or taken on long hikes in order to give them first-hand information on natural phenomena, trees, flowers, insect life, archeology, and history. Motion-picture displays and campfire talks also have served to make the emergency conservation program interesting.

"Bigger and better campfire amphitheaters" appears to be the slogan in several of the national parks, notably in Sequoia, Grand Canyon, Acadia, Zion, and Glacier. Much is done for the comfort of those who attend lectures at Mesa Verde, where, in the attractive new amphitheater, canvas pads are furnished to the visitor and special drafts, after the fashion of the ancient kivas, keep the smoke going up vertically. Attendance at campfire programs continued strong, sometimes as many as 3,000 being present in the larger parks on a single evening; young and old enjoying the varied programs of music, lectures, and nature talks.

A special type of educational service has been the development of pageantry in the interpretation for the visitor of the spirit of various parks. For the dedication of the new Wawona Tunnel at Yosemite the park naturalist prepared a pageant of progress, portraying the early history of Yosemite Valley. To celebrate the opening of the new transmountain road in Glacier, a colorful Indian pageant was

arranged. Three local tribes of Indians encamped on the pass and in full regalia smoked the pipe of peace, a fitting celebration for the International Peace Park. At Sequoia an operetta was presented on July 4, written by Lloyd Stone, and at Mesa Verde, through the assistance of Mrs. C. Marshall Finn, another in a series of beautiful pageants depicting the prehistoric life of that region was presented late in July before a large audience, one of the visitors being Mrs. Harold L. Ickes, who gave a colorful and interesting talk as part of the program.

MUSEUM DEVELOPMENTS

The year has been marked by noteworthy achievements in museum expansion. At Grand Canyon, the Wayside Museum of Archeology has been completed and opened to the public, with a trained archeologist in charge. In Yellowstone, the development of the roadside exhibit program has continued with splendid results. Interesting examples of such exhibits deal with the rhyo-travertine formation, and with the beaver in explaining a beaver dam. The latter portrays vividly the relationship of the beaver to various aspects of American history—as, for instance, the fur trade—and explains the life history and habits of the animal. Several of the older museums have undergone changes and improvements. In the case of the Mammoth Museum at Yellowstone, a new geology room has been added and the basement remodeled to house the library. At Fishing Bridge Museum and at Mount Washburn Lookout in Yellowstone, long-range telescopes have added to the enjoyment of the visiting public.

An important museum project pertains to Glacier National Park, where it is hoped several buildings will be erected. A large building at Rocky Mountain to be used as a historical and ethnological museum awaits installation. At Mount Rainier National Park also there is need of better housing. Improvements have been made at Petrified Forest and Casa Grande and with new headquarters at Montezuma Castle, Tumacacori, and Aztec Ruins will come the need for installation of exhibits. The museum expert will need additional help to facilitate this rapidly growing program in three major parks and in the southwestern monuments.

The Sinnott Memorial in Crater Lake National Park was opened to the public during the summer, although installation of exhibits had not been completed. Through telescopes and parapet exhibits the visitor to that museum is enabled to view closely the finer features of the park and gain an understanding of the story told by the rocks. A leaflet giving a diagram of the station and a description of the exhibits is handed each visitor. All field trips start with a lecture given in the station and a naturalist gives lectures at set times during the day. In an effort to lead the observer to a more complete appreciation of the beauty of the scene, a committee of three men from the

University of Oregon spent 3 weeks on the ground to work out the best type of plan for presenting the esthetic features. The supporting exhibits for the interior room still await installation.

Yavapai Station at Grand Canyon functioned better than ever before. It has been found that a simple explanation of how to use the station brings better results than a formal lecture. Several improvements have been made in the presentation of exhibits. A revised leaflet giving a copy of all labels is now available in addition to the one describing the method of using the station.

The museum losses sustained when Grand Canyon Lodge burned have not been replaced. A room full of exhibits, including a relief model, were totally destroyed.

At Yosemite improvements have been made in the museum and the branch at Mariposa Grove completed. Some improvements are contemplated at Glacier Point and a station for the study of granite is to be arranged on Sentinel Dome.

In the East the historical museums at Colonial National Monument and George Washington Birthplace National Monument are gaining strength. With the addition of the nationally famous Washington's Headquarters at the Morristown Historical National Park, rare furniture, manuscripts, and other Washingtonia valued at thousands of dollars were included through the generosity of the Washington Association of New Jersey. The new military and other historical areas recently transferred to the jurisdiction of this Office have provided other noteworthy museum acquisitions, notably the Lee Mansion in Arlington. In the West, Yellowstone, Glacier, Rocky Mountain, and other parks have continued to accumulate interesting historical objects, especially in Indian artifacts. The planning, preparation, and installation of museums is receiving much more attention than in the past, with the result that museums now serve in most cases to give the visitor an excellent interpretation of the significance of any given area. This Office as yet lacks the funds for adequate museum personnel, and for large models needed to give the visitors graphically the best interpretation possible of the extent and relationship of the chief features. This is especially important in connection with our plans for better understanding of the national military parks.

WILD-FLOWER DISPLAYS

In the last annual report of the National Park Service, attention was called to the tendency to abandon cut-flower exhibits and to develop instead permanent botanic gardens. This year the creation of the botanic garden at Old Faithful Museum in Yellowstone and the gardens near the crater rim at Crater Lake indicate that other steps have been taken in this direction. The new garden at Yosemite, provided through the interest and generosity of Miss Marjorie Mont-

gomery Ward, presented a real spectacle in its first year of bloom. This garden is improving rapidly under expert supervision. Wild flowers are characteristic of practically all parks and monuments and the public shows continuing interest in learning about them. Even park companies are aiding by planting gardens of native wild flowers. The Ahwahnee Hotel in Yosemite has developed a particularly fine showing of native wild flowers.

SELF-GUIDING TRAILS

Glacier continues the leader among the parks in the development of nature trails where five are functioning. There is no question as to their value, but the upkeep is proving a problem. There is continuous loss of markers by theft and other vandalism necessitating constant replacements. No outstanding new trails have been developed during the year though several are planned.

UNIVERSITY FIELD CLASSES AND THE VISIT OF INTERNATIONAL GEOLOGICAL CONGRESS

Different universities and colleges continued to send field classes to the various park and monument areas, though the curtailment of funds somewhat reduced the numbers. At least a dozen universities and an equal number of teachers' colleges sent students into the parks on study trips. In addition, organized tours of students numbered at least six.

An epochal event during the past season was the meeting in Washington, D.C., of the International Geological Congress, followed by a tour of several of the national parks and monuments, and other points of interest in the Southwest and far West. Park naturalists at Grand Canyon, Zion, Yosemite, Crater Lake, Carlsbad Caverns, and Yellowstone met the distinguished visitors and helped explain scientific features. One ranger naturalist at Crater Lake displayed conspicuous versatility, lecturing to one party in three languages.

YOSEMITE SCHOOL OF FIELD NATURAL HISTORY

The Yosemite School of Field Natural History, a training school for naturalists desirous of entering national park work, held its ninth session. A very fine group of 20 graduate students—12 men and 8 women from 8 different States—was enrolled. New features added to the school's curriculum were the use of pack animals on the week's trip in the High Sierra and a biological survey of a proposed research reserve. Instructors recruited from four of the Nation's principal universities comprised a notable instructional corps. Attendance at the Yosemite Junior Nature School reached a new record of 379 different children and an average of 74 at each session. This continues to be the only specialized service to children.

LIBRARY DEVELOPMENTS

Progress has been made during the year in the development of adequate library facilities for all areas under the jurisdiction of the Office of National Parks, Buildings, and Reservations. Books and important manuscript materials, as well as some old newspaper files, have been collected, and noteworthy steps are being taken to classify, with the help of the American Library Association, all accessions. Like the museum, the park library is a great help to the complete interpretation and understanding of the area. Perhaps the outstanding addition of the year is the collection of letters written by Washington during his stay at Morristown, as well as others to him, which were donated to the Morristown National Historical Park at the time of its creation.

In Yellowstone, new quarters for the library have been provided in the basement of the museum at Mammoth. The fine collection of books is now fully catalogued, and was made accessible to the public this past summer. Yosemite's library continues to grow in size and use. Mesa Verde's probably comes third in size, but proper housing has not been provided.

Through the interest and help of the national parks library committee of the American Library Association, headed by Mr. C. E. Graves, a development program has been outlined and an effort is being made to gain financial support for a master library and proper personnel. Library development has not kept pace with the educational program and there is great need for promoting this feature of the service.

SCIENTIFIC RESEARCH

The work of the naturalist-historical service of this Office is not primarily to conduct pure research. Its primary problem rather is the direction, extension, and correlation of research in order to secure a basis for proper interpretation of scientific features. Consequently the naturalist and historian carry on such research as is indispensable to their work, and at the same time avail themselves as far as possible of the results of the research of others which bear upon their situation, and they seek in every way to promote research which will be helpful in solving scientific problems.

Various governmental, semipublic, and private agencies have continued to aid materially. Dr. A. P. Meinecke, of the Bureau of Plant Industry; Dr. T. S. Palmer and Dr. O. J. Murie, of the Bureau of Biological Survey of the United States Department of Agriculture; Mr. Harry Hommon, of the United States Public Health Service; Dr. A. S. Hazard, of the Bureau of Fisheries; Dr. J. C. Merriam, of Carnegie Institution; Dr. Alexander Wetmore, of Smithsonian Institution; and Dr. Waldo G. Leland, of the Council of Learned Societies have each of them personally, and through the organizations

they represent, assisted the work of the national park program. A group of the chief historians of the Nation studied with us the problem of inaugurating the historical policies which led to the creation of Morristown National Historical Park, among them Dr. J. Franklin Jameson, of the manuscripts division of the Library of Congress; Dr. John C. Fitzpatrick, editor of the bicentennial edition of the Writings of George Washington; Dr. Evarts B. Greene, of Columbia University; Dr. Edmund C. Burnett, of Carnegie Institution; and Dr. Samuel F. Bemis, of George Washington University. Dr. Charles Moore, of the Fine Arts Commission, has given generously of his time to the careful investigation of many problems relating to the work, as has Mr. H. P. Caemmerer, the secretary of that Commission.

Investigations range in subject matter all the way from fine arts and history in the District of Columbia and vicinity to geology, plant and fish life, and archeological excavations in the Southwest and far West. In the latter connection, the work of Jesse L. Nusbaum, of the Laboratory of Anthropology at Santa Fe; Earl Morris, of Carnegie Institution; Dr. Harold S. Colton, of the Museum of Northern Arizona; and Dr. Neil Judd, of Smithsonian Institution have been outstanding in numerous matters which have been referred to them.

Dr. H. P. Mora, of the Laboratory of Anthropology at Santa Fe, examined various ruins at the Petrified Forest National Monument and studied the Flattops for ruin sites. He found evidences of pit houses on the large mesa and a considerable number of Hohokam shards of plain ware. This is the first time, according to Dr. Mora, that the Hohokam pottery has been found so far north. The various pottery found by him seems to show a mingling of cultural influences from the east, south, and west.

The Museum of Northern Arizona has continued archeological research in the ruins of Wupatki National Monument. The University of Arizona has begun reconnaissance work in the Verde River Valley adjacent to Montezuma Castle National Monument. The Museum of New Mexico, School of American Research, and the University of New Mexico have jointly continued excavations at Chetro Kettle in the Chaco Canyon National Monument.

It should be added that as an incident to the emergency conservation work the addition to the staff temporarily of several trained investigators in historical research and landscape architecture has made possible the development in several of the major historical areas a tremendous amount of new and important data which will be of permanent value in the educational program.

Dr. John C. Merriam, president of the Carnegie Institution, has continued studies on the scientific features of various parks and

methods of presenting the findings of scientists to the general public. With financial aid made possible by Dr. Merriam a committee of three men, headed by R. W. Leighton, chairman of research in the University of Oregon, have been studying ways of presenting the beauty of Crater Lake in such a way as to have the public appreciate it. Other grants of aid have made possible studies of the Algonkian rocks of Grand Canyon by Messrs. I. N. Campbell and John H. Maxon, of California Institute of Technology, and by Dr. Hines, of the University of California. Dr. Hines also spent some time on volcanological problems in Crater Lake National Park.

Dr. H. C. Bumpus continued studies of educational methods in Yellowstone and revised Trailside Notes, a unique and useful guide for the motorist driving around the loop. Small illustrations call attention to the main scenic and scientific features.

The University of Michigan initiated a geographic survey of the Grand Teton region, and the University of Chicago the geology of the western slope of the Tetons. The work of a sizeable group of scientists connected with the expedition to Rainbow Bridge and Monument Valley arranged by Ansel F. Hall, of the National Park Service, should receive emphasis as producing much valuable scientific data on this region. Studies of granites have been continued in Yosemite by Dr. Ernst A. Cloos, of Johns Hopkins University. Dr. A. E. Douglass, of the University of Arizona, has carried forward some noteworthy investigations in tree rings in the Southwestern monuments, which has led to the tentative dating of several of the principal prehistoric ruins at Mesa Verde. Dr. Field, of Princeton University, has had two students to continue work on the geology of Yellowstone National Park. Dr. H. E. Gregory for the United States Geological Survey continued geological studies in Zion National Park. Several field sections of the International Geological Congress visited several national parks. The presence on the ground of these widely known scientists brought forth new explanations and theories regarding phenomena and technical problems relating to geology.

There were many other eminent scientists who visited the national parks pursuing independent investigations. Among these were Dr. W. W. Atwood, of Clark University, who continued glacial studies in Crater Lake, and Lewis Williams, of the University of Wyoming, who studied the flora of Grand Teton National Park.

NATIONAL PARK EXHIBITS AT A CENTURY OF PROGRESS

This Bureau was extremely fortunate in being represented at a Century of Progress Exposition by exhibits in two of the most interesting and widely visited buildings at the fair—the Hall of Science and the Federal Building. An average of nearly 30,000 persons

visited these exhibits each day. At the close of the fair, nearly 5,000,000 persons, many of whom had only the most vague ideas of the Nation's system of national parks and monuments, had examined these interesting and instructive displays.

The exhibit in the Federal Building was visited by the largest number of persons. Its principle feature was a model of Mount Rainier, 20 feet wide and 12 feet high, showing the Nisqually Glacier. Automatic lighting reproduced the 24-hour cycle of light changes on the mountain, the glacier was represented by real ice, and a snow storm that stopped itself in 3 minutes could be started at the will of the operator. A typical model of a national-park camp-fire group being entertained by motion pictures was shown at the side. The motion-picture feature of the model was real, though the screen was small. The reels were changed daily, and in this way most of the parks and many of the monuments were strikingly presented to thousands of exposition visitors. Other educational material in this booth included a large map of the United States showing the location of all the national parks and monuments, and 39 of them were represented by oil-painted scenes of great beauty. Copies of all national-park publications and a collection of splendid photographs showing wild animals and beautiful scenery were displayed on a rack. A unique feature of the Federal Building exhibit that turned out to be a splendid advertising medium were six great log benches installed for the comfort of visitors who wished to watch the changing lights on Mount Rainier and the motion pictures. These benches were made from a great ponderosa pine cut in the Grand Canyon region. Many visitors acquired the habit of using the booth as personal headquarters and "We will meet you at the log benches", was a remark often overheard in the Federal Building.

This exhibit in the Hall of Science consisted chiefly of models presenting the geological features of nine national parks and the Petrified Forest and Rainbow Bridge National Monuments beautifully displayed with indirect lighting. Appropriate motion pictures were exhibited on a large screen arranged in an alcove. The parks represented were Bryce Canyon, Carlsbad Caverns, Yellowstone, Grand Canyon, Grand Teton, Hawaii, Mesa Verde, Rainier, and Yosemite. Also in the Hall of Science, but not in the national-park group, were relief models of Crater Lake and Glacier.

The exhibits were in charge of experienced national-park men in uniform, who took advantage of every opportunity to serve visitors in a personal way. Much valuable contact work was thus accomplished. A large number of persons who had planned to visit only the Fair extended their itineraries to include one or more of the western parks.

ANIMAL CONDITIONS

The national parks and national monuments are looming ever more important in the wild-life situation of the United States as the encroachments of civilization render the existence of wild animals increasingly precarious. Even in the parks and monuments, mere protection has ceased to be enough. It is necessary to make specific studies of conditions necessary to animal welfare, and to this end the Division of Wild Life Studies was established last year as a definite division of this Bureau.

For several years wild-life studies were carried on with personal funds contributed by George M. Wright—now chief of the new division—as a personal contribution to the work of the National Park Service. Last year it was possible for the Service to bear nearly half the expenses of these studies. It is therefore especially gratifying to announce the establishment of the division the past year on a full-time Government basis.

Two reports of the investigation of the division were made available for distribution. The first, entitled "A Preliminary Survey of Faunal Relations in National Parks", gives a review of the wild-life problems of the park system and outlines a conservation policy to be followed. The other, "History and Present Status of Breeding Colonies of the White Pelican in the United States", was issued in rotaprint, only 1,000 copies being available.

As a result of studies at the Petrified Forest National Monument, plans are now under way for the development of this area as an outstanding antelope range through the erection of stock-proof fencing and the provision of water holes. It was found to be an ideal natural habitat for this plains animal. Several hundred antelope now range in the vicinity of the monument. Study of the Grand Canyon National Monument developed the fact that antelope should be reintroduced in that area when general development plans can be undertaken. The antelope herd on the Tonto Plateau in the Grand Canyon National Park increased to 28 with the addition of 8 kids.

Studies of the Bandelier National Monument in New Mexico indicate that this area under park supervision gives promise of becoming one of the outstanding regions in the Southwest for the development of natural game conditions.

The special protection given trumpeter swans in Yellowstone National Park for several seasons resulted last summer in the return of these great birds to Swan Lake, a body of water which, despite its name, they have neglected for many years. Since the lake has little cover for the birds, their use of it indicated an increase in numbers, and a spreading to less desirable locations. Swan Lake is one the

main loop road and thousands of visitors have been thrilled by the sight of the swans, followed by their cygnets, swimming across the lake. Canada geese continue to nest in large numbers. The pelican colony on Lake Yellowstone is thriving.

A series of dry years has resulted in poor forage for the northern herd of Yellowstone elk which winters near the Gardiner entrance. Park officials express the fear that, in spite of extensive feeding, a considerable loss will result if heavy snows are experienced during the coming winter.

In the 1932 annual report of the Director of the National Park Service mention was made of bear-control measures undertaken in the Yellowstone. As a result, injury to persons and property by these animals was greatly reduced during the past season and a number of isolated camp grounds were again in use. An effort will be made still further to reduce trouble by installing bear-proof garbage cans and food safes, thus removing the main incentives to bears to enter the camps. A new fence at the canyon bear-feeding grounds now gives increased protection to the crowd which nightly gathers to see the anywhere from 15 to 30 grizzlies feed. Unquestionably Yellowstone provides the greatest grizzly show on earth. Yellowstone visitors who took the advice of the new sign reading "Look for Moose" were rewarded in large numbers last season, so abundant has this great game animal become.

An interesting observation from Mount McKinley National Park, where an increase of all park animals was reported, is that the caribou, mountain sheep, and moose fare better in extremely cold weather with a light snowfall than in moderate winters with heavy snows. Last winter the caribou remained in the park for the first time in several seasons. Animal life in Glacier National Park also is showing a large increase and Yosemite wild life had a good year.

Deer were numerous in Crater Lake National Park, although because of its limited area and the late recession of the snow cover they did not return to the park until very late in the season. If these animals are to be made a major attraction to Crater Lake visitors, an extension of the park to the west or enforced protection during the winter months is necessary. The disappearance of white-tailed deer in Yellowstone is still difficult of explanation.

From Hawaii National Park comes the report that while the number of birds—the only native animal life in the park—is increasing, meantime many of the more important native species have become extinct. Introduction of birds from other sections of the world, continually carried on in the Hawaiian Islands, it is feared, will eventually result in the native birds being crowded out.

FISHING AND FISH-CULTURAL OPERATIONS

Improvements and investigations relating to fish culture were somewhat limited during the year owing to curtailment of funds. Nevertheless a limited survey was carried on in Yosemite National Park, principally of the Merced and Tuolumne Rivers by specialists of the United States Bureau of Fisheries as part of a cooperative arrangement between that bureau, the State of California, and the National Park Service. Investigations also were made of various waters in Yellowstone, Glacier, Grand Teton, and Sequoia National Parks.

Completion of the Bureau of Fisheries hatchery at Silver Springs, near the north boundary of Mount Rainier National Park last fall provided facilities for stocking park waters with trout. The capacity of the hatchery at present is 750,000 trout, and enlargement can be made when necessary and as funds are available.

Excellent fishing conditions were maintained in all parks, with continued improvement noted in several. The national parks provide as fine fishing as can be found anywhere in the United States. It should be the best in the country and it will be my purpose to make it that.

The collection of 28,234,000 black-spotted trout eggs at the Yellowstone hatchery exceeded previous years, with the possible exception of 1922. Of this, over 8,000,000 eggs were retained at the Yellowstone hatchery for planting in that park and 1,000,000 eggs each were sent to Glacier and Grand Teton National Parks, the State Fish hatchery at Ashton, Idaho, and the Federal fish hatchery of Bozeman. Those to the Ashton hatchery were for planting in the Bechler River section of Yellowstone Park and those to the Bozeman hatchery, waters on the west side of Yellowstone Park. These two shipments were necessary by reason of congestion of the Yellowstone Lake Hatchery and to eliminate longer trips in distributing the fish. Three hundred thousand eggs were also sent to Mount Ranier National Park. Large fingerling also were planted in the park from the rearing ponds at Mammoth Hot Springs and the Federal fish hatchery at Bozeman.

An outstanding development in Yellowstone Park was the successful handling of grayling eggs at the grayling hatchery erected during the year at Grebe Lake. A total of 2,118,400 grayling eggs was collected and hatched 94.4 percent, this being so far as known the all-time record for the hatching of grayling eggs. Grayling also were found definitely established at the head of the Illiouette Basin in Yosemite Park and it is hoped within a few years the supply will be adequate for fishing. Fine grayling fishing was reported from Glacier, as in past years.

Planting of eggs was continued in Crater Lake, General Grant, Great Smoky Mountains, Sequoia, and Yosemite National Parks through the cooperation of Federal and State hatcheries.

No fish were planted in the Grand Canyon National Park during the year as the Bright Angel Creek was approaching a point where an oversupply of fish might occur. In this stream, a supply of live freshwater shrimp was introduced to augment the natural food supply.

During the year results were made available of a biological survey made of conditions in Glacier National Park last year by the United States Bureau of Fisheries, and fish plants in the park were made in accordance with the facts disclosed by the survey.

PROTECTION OF PARK FORESTS

The past year in forestry has been marked by unexpected accomplishments in many forestry activities, largely through the assistance of the Civilian Conservation Corps.

Successful campaigns were waged against forest insects. Several epidemics of major importance were either stamped out or reduced to a point where annual maintenance control will prevent further losses. Among these were the serious bark-beetle infestations in the pine belt in the southeast portion of Yosemite National Park and on adjacent national-forest areas, controlled at a total cost of more than \$30,000. A similar bark-beetle epidemic in the northwest section of the Yosemite remains uncontrolled, but the Forest Service has received a large grant of the public-works funds for control measures on the adjacent forest and it is hoped funds also will be available for use in the park. Infestations in Crater Lake were brought to a point where comparatively inexpensive annual maintenance only is necessary. A rapidly growing mountain-pine beetle infestation in mature stands of lodgepole pine in the Hockett Meadow district of Sequoia Park also was eradicated.

Weather conditions played a large part in the reduction of bark-beetle attacks in the northwestern States and part of California.

Nevertheless, there still remain two great areas in Yellowstone and Glacier Parks where the magnitude of the infestation apparently places it beyond human control. The infestations center in the parks and extend out into the surrounding forest areas. Investigations of these regions last year indicated that the cost of control probably would run up into the hundreds of thousands of dollars without positive assurance that successful control would be possible. The heavy freeze of the winter of 1932-33 killed many of these beetles, however, and as this report goes to press, careful surveys again are being made over both areas to ascertain the practicability, in view of this development, of now undertaking control.

Control of the white-pine blister-rust was continued in Mount Rainier and Acadia National Parks and preliminary ribes eradication started in the California parks. This disease is spreading rapidly, both in the northern Rocky Mountains region and in the Far West.

Unless checked, it is only a matter of time before it will reach the white-pine stands in Glacier National Park and the forests of sugar pines and other white pines of the California parks. Anticipating this apparently inevitable infection, surveys are being made in Crater Lake, Yosemite, Sequoia, and Lassen National Parks to determine the distribution of the white pines and the occurrence of current and gooseberry bushes.

In the field of fire-protection, great advances were made in prevention, and also in detection and suppression. As a result of these factors, most of the fires that broke out in national parks were immediately controlled and held to a minimum acreage.

Another extremely important forestry activity in which great progress has been made during the year is the preparation of the forest-type maps which are so essential in planning for insect and blister-rust control and other important operations.

In addition to the broad forestry problems handled, as indicated above, attention also was given many detailed problems. Interesting among these was the protection given the famous General Grant tree, in the national park of the same name. Flood channels exposing the roots of this tree were filled during the fall of 1932 and a diversion ditch constructed to carry the water along the upper slope to a safe point beyond the tree. A swale within the protective railing also was filled with many truckloads of earth, protecting the southern exposure of the base.

PLANNING AND PRESERVATION OF PARK LANDSCAPE

Increased use of the national parks and monuments in recent years had made necessary ever-watchful planning to preserve the natural beauty of these areas. To this end a corps of architects, landscape architects, and engineers is kept busy throughout the year.

The Office of National Parks, Buildings, and Reservations has planned ahead on its developments and has established a 6-year development program in accordance with the Employment Stabilization Act. Though not yet in their ultimate form, master plans for each park, developed in cooperation between the park superintendent, the landscape architects, and the engineering staff proved of invaluable assistance in enabling this office to submit immediately, in connection with the public-works program, an outline of national-park development accompanied by plans, estimates, and justifications. They have also served many other purposes and their use is on the increase.

The master plans were commenced 2 years ago. A year ago plans were completed for all but five of the western parks and some of the monuments. This year plans were completed for all of the remaining western areas and the first year's editions brought up to date.

Master plans will be brought up to date each fall, showing status of developments at the end of the preceding construction season. The eastern national parks are now being studied but the master plans have not been prepared. It is hoped that by the end of the year a good many of the master plans will be completed for the eastern areas.

These plans show the entire development scheme for the area affected and embrace a wide variety of subjects, including the road-and-trail systems, fire-control plan, developed and special areas, general layout of each tourist and administrative area, utilities plans of each populated area, parking areas, relocation and arrangement of future buildings, and sheets of typical details such as guard rails and culverts.

Special attention has been given to location and design, with the ready assistance and cooperation extended the office by the Bureau of Public Roads. Much study has been made of road sections. Among other results, the rounding and flattening of cut slopes has resulted in improved appearance and lower maintenance costs on roads. Though in use but 4 seasons, this treatment is already widely adopted by other road-building agencies. Study is also being given to road shoulders, width of slopes, and size and type of ditches and drainage structures.

A variety of buildings, bridges, gateways, tunnel portals, and similar structures were constructed during the year from plans and specifications prepared by the architects, each carefully planned for its particular site. Through gradual raising of building standards, this year's buildings represent the best yet obtained in the parks.

The speedily launched President's emergency conservation program as applied to the national parks necessitated very careful consideration of landscape problems.

WINTER USE

Use of the national parks and monuments during the past winter was marked by an increased interest in all forms of winter sports, but notably in skiing. Sixteen of the national parks were open all year, with varying types of accommodations, ranging from hotel and lodge service to camp grounds for travelers carrying their own equipment.

Popular demand for improved winter-sports facilities in the mountain parks is constantly increasing, and every possible consideration is being given to these demands for enlarged usefulness of the national parks. However, careful study of every angle of the problem is being made, and we are proceeding very slowly in the hope that few steps will have to be retraced.

Yosemite National Park experienced the usual heavy winter travel, which reached its peak during the annual Yosemite San Joaquin-Sierra Winter Sports Carnival. As in the past, Governor James Rolph attended and took an active part in the picturesque ice pageant that featured the carnival program.

Looking toward future developments in Yosemite, the park operator has recently made a special study of winter sports in the leading resorts of this country and Europe. This study has yielded information that will be of basic importance in developing winter-sports policies. It reveals that skiing is the basis of such activities throughout the world, and that the finest areas for this sport in Yosemite National Park are above the 8,000-foot level. The most important factors in selecting ski fields are open slopes, deep snowfall, consistent low temperatures, and the quality of the snow. There are many such areas to be found in national parks, and the cream of those existing in Yosemite are believed to be in the region beginning at Snow Creek and extending to the slopes of Mount Hoffman, Tenaya Peak, and Sunrise Pass. Many skiing experts state that there are slopes in this region comparable with the finest runs in Europe.

Winter sports continued to increase in popularity in Mount Rainier, where the toboggan slide at Longmire and the ski fields in the Paradise Valley region attracted large numbers of winter visitors. The second annual Snow Sports Carnival of the Seattle Junior Chamber of Commerce was held April 1-2. With perfect weather and Mount Rainier for a background, this was a spectacular and colorful affair attracting large numbers of visitors.

In spite of severe winter weather, Crater Lake National Park experienced a slight increase in travel. This is regarded as representing a greatly increased public interest in the park that under favorable conditions would have resulted in a much greater travel increase. The Crater Lake Caravan, sponsored by the towns of southern Oregon, visited the park on April 23. Though the snow averaged 20 feet in depth in some places, nearly 400 cars made the trip to the lake rim, where special parking places had been cleared. Ski contests, under the direction of the Crater Lake Ski Club, featured the program. The policy of keeping the road to the rim open during the winter has aroused a new interest in this park, as Crater Lake in winter garb is a beautiful and inspiring spectacle.

The Colorado Mountain Club held its annual winter outing at Fern Lake, and a large number of skiing parties visited the east side of Rocky Mountain National Park. This park has long been a favorite with winter-sports enthusiasts. Emergency conservation labor is used to build a winter-sports area in Moraine Park, and a fine ski hill will be a feature of this undertaking.

The road to Giant Forest in Sequoia National Park was maintained in good condition during the past winter, and this combined with deep snow and good weather encouraged winter travel. Nearly 6,000 persons visited the park during February, a substantial increase over the number recorded for the same month in the preceding year. Snow sports brought 20 percent more winter travel to General Grant National Park than recorded for 1932.

The south rim of the Grand Canyon is visited by large numbers during the winter months, and though winter travel to that area declined during the past year, at the end of April nearly 21,000 visitors had been recorded for the period beginning October 1.

Though it is generally regarded as off the beaten track, thousands of people visited Zion Canyon National Park each winter despite the fact that from the middle of October to the middle of May no accommodations are available except camp sites. The customary quota was recorded this year.

Carlsbad Caverns received 13,002 visitors for the period from October 1 to April 30, a decrease over the preceding year. This was undoubtedly due to the general decline in transcontinental travel.

Hawaii National Park experiences heavy winter travel, and this year it amounted to 72,487. Though the total travel for the winter period was less than that recorded in 1932, it is interesting to note that travel for April this year was nearly double that for the same month last year. This year there were 14,000 visitors during April and last year 7,554.

In spite of unfavorable conditions throughout the country, nearly 90,000 persons visited Hot Springs National Park during the winter season. The balmy Arkansas climate makes this reservation a popular winter resort. It should be better patronized.

No official count is made of travel to the Great Smoky Mountains National Park, but the superintendent reports that travel to that park, which is convenient to the large centers of population is greatly increasing at all seasons of the year.

Wind Cave, Lassen Volcanic and Platt National Parks experienced a travel decrease that was regarded as normal under prevailing conditions. Acadia National Park in Maine, as usual, remained open all year, but no official travel count was kept.

Many of the national monuments are located in regions that enjoy mild climates and consequently experience considerable winter use if road conditions are at all favorable. This is particularly true of many of the monuments of the Southwest, and special interest has centered in Petrified Forest National Monument since the bridging of the Rio Puerco and the addition of the Painted Desert section to this monument. Travel to this reservation from October 1 to April 30 totaled 49,234.

Winter travel to Muir Woods National Monument in California amounted to nearly 20,000. The only two national monuments in the East, Colonial and Wakefield in Virginia, experience heavy winter travel on account of the mild climate and their proximity to the highways between New York and Florida.

PUBLICATIONS AND VISUAL MATERIAL

This Office was handicapped during the year in its efforts to meet increased demands for literature by the fact that its printing fund was the lowest in nearly 10 years.

Limited editions of the various national-park circulars of general information with the exception of those for Grand Teton and Mount McKinley National Parks were issued. This year for the first time an individual circular of general information was issued regarding the Carlsbad Caverns National Park, using the offset process. A total of 455,000 general-information circulars was issued.

To augment the editions of information circulars it was possible to print motorists guides for Crater Lake, Glacier, Mount Rainier, Rocky Mountain, Yellowstone, and Yosemite National Parks. In all 184,000 of these guides were printed and practically all of them forwarded to the parks and distributed to motorists as they entered these areas.

With the influx of thousands of boys into our national parks under the emergency conservation program it was the opinion of Director Robert C. Fechner of emergency conservation work and officials of this Office that special information on our national parks should be available to familiarize these boys with the areas in which they were working. To meet this demand a 32-page brochure entitled "The National Parks and Emergency Conservation" was issued, an edition of 50,000 copies being printed on the offset process.

A thousand copies of Occasional Paper No. 1, a contribution of the Wild Life Division of this Office, written by Ben H. Thompson, of that division, and entitled "History and Present Status of the Breeding Colonies of the White Pelican in the United States", was rotaprinted. This paper has been referred to previously.

An edition of 15,000 copies of a 12-page leaflet entitled "Desert View Drive in Grand Canyon National Park" was printed for distribution at the Grand Canyon National Park. This leaflet contains a brief description of each major feature seen from the various places visited on the Desert View Drive along the east rim of the canyon.

Reprint editions of two Grand Canyon publications entitled "How Yavapai Station Can Help You to Understand and Enjoy the Grand Canyon" and "What to Do and See in Grand Canyon National Park (South Rim)" were issued and practically all copies forwarded to the park for distribution.

To meet the increased demand for information regarding the George Washington Birthplace National Monument a small folder was rotaprinted, primarily for distribution to visitors at the monument.

Early in August 5,000 copies of a large recreational areas map, approximately 42 by 31 inches in size, were issued. On it are indicated the locations of all the national parks, national monuments, approved park projects, national military parks, national forests, and State parks and reservations. Principal connecting highways are also shown. This free map takes the place of the map of the western United States, showing the National Park-to-Park Highway formerly issued by this Office.

There has been much favorable comment in the press and otherwise regarding this map. As a result of the newspaper publicity the initial edition of 5,000 copies was exhausted in 2 weeks' time. A reprint is now being run off.

The National Conference on State Parks, State-park organizations, other bureaus of the Government, and the American Automobile Association assisted this Office in the preparation of this map. Their cooperation is greatly appreciated.

Fauna Series No. 1, entitled "Fauna of the National Parks", written by George M. Wright, Joseph S. Dixon, and Ben H. Thompson, of the Wild Life Survey, already has been mentioned.

"Plants of the Rocky Mountain National Park", by Ruth E. Ashton, is a notable addition to our publications dealing with the flora of the national parks. It has met with widespread acclaim and sets a new standard in outward appearance.

Both of the foregoing publications dealing with the fauna and flora are for sale distribution by the Superintendent of Documents at the Government Printing Office, the first-mentioned selling for 20 cents and the latter for 25 cents.

Students of national-park history will find another sale publication issued this year, entitled "Early History of Yellowstone National Park and Its Relation to National Park Policies", by Louis C. Cramton, of great value. This publication sells for 10 cents.

The national parks and monuments continued to receive a great deal of advertising through the medium of illustrated lectures, radio broadcasts, motion pictures, and magazine and newspaper references.

During the year 280 motion-picture films were lent to interested individuals and organizations, and approximately 4,000 photographs and 7,000 lantern slides borrowed from this Office.

PARK-ROAD DEVELOPMENT

In the 1933 fiscal year, the cash appropriated for road and trail work amounted to \$7,500,000, the same amount which was available in 1932. The Secretary of the Interior was also authorized to obligate

contractually on construction projects an additional amount of \$2,500,000 in 1933, as compared with \$2,850,000 in 1932. Of the \$7,500,000, the Interior Department Appropriation Act for the fiscal year 1933 made available \$4,500,000 (which includes \$2,850,000 authorized for advance contractual obligations in the 1932 appropriation act), and \$3,000,000 was appropriated by the "Emergency Relief and Construction Act of 1932."

There was made available in cash by the Interior Department Appropriation Act for the fiscal year 1934, \$2,435,700 of the \$2,500,000 which had been authorized in the previous fiscal year for advance contractual obligations, only \$1,236,273.28, however, being actually available for expenditure after compliance with instructions requiring impoundment of \$1,199,426.72. In addition, projects amounting to \$17,059,450 were approved by the Public Works Administration for a 2-year public-works program of road and trail construction.

As in the past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction in the national parks and monuments except in Mount McKinley National Park, Alaska, where the road work has been performed by the Alaska Road Commission. We especially appreciate our relations with this fine Bureau which, under the direction of Thomas H. Macdonald, is showing such splendid cooperation and results.

There have been constructed, reconstructed, and improved to date (cleared, graded, and surfaced) 644.80 miles of roads. In addition, work in various stages of construction includes 345.9 miles of clearing and grading and 161.1 miles of surfacing. Considerable progress has been made on construction of adequate trail systems, \$1,813,-372.37 having been expended on the construction of 730.39 miles of trails built on suitable standards of grade alinement. Although good progress has been made possible with the funds provided for the past several years, it is estimated that there still remain 915.72 miles of road to be constructed and improved. The total road and trail mileage is variable, however, due to the acquisition of additional areas in existing parks and monuments, and the establishment of new reservations.

Information concerning the most outstanding of the road projects appears in the summary of activities of the various parks under "The Year in the Parks."

PUBLIC-UTILITY SERVICE

The two most important subjects discussed at the fourth annual conference of the operators of public utilities in the national parks, which met in Washington last November, were the transportation and rate policies for the season of 1933. With the continued decline in

the number of visitors transported through the parks in the motor busses of the authorized operators, there has been, conversely, a steady increase in the number of visitors transported in busses entering the parks under various conditions. With this change in the trend of business, it was recognized that the regulations with respect to the operation of busses in the parks must be changed to meet changed conditions. Therefore, the park operators recommended the rescinding of all previous orders with respect to bus transportation in the parks, and the issuance of a new order embodying substantially the following provisions:

All companies or persons should be prohibited from engaging in the business of motor transportation handled directly or indirectly within the parks except those operators licensed by the Secretary of the Interior, or the following specific exceptions.

1. Commercial cars of nonprofit organizations, such as Boy Scouts, schools, etc.

2. Commercial pleasure cars rented by tourists by the week, month, etc., for a tour in which the trip to the park is merely incidental.

3. Bona fide "casual" busses carrying tourists on a contract basis when a visit to a park is an incident to a tour. (Under this ruling transcontinental bus tours visiting parks as an incident to a trip would be admitted. On the other hand, regularly advertised or solicited transcontinental tours, operating during the travel season, similar to those contemplated by the Greyhound companies for 1933 would not be admitted.)

4. Bus companies, tour agencies, individuals, and all others seeking to operate bus tours from points within the same State to a park or from nearby cities and towns from an adjoining State will not be admitted into that particular park.

Careful consideration was given to these recommendations and they were approved by former Director Albright under date of December 15, 1932.

For many years the isolation of the various parks was such that for the purpose of operation, management, and rate structures the parks were substantially economic "islands" with respect to their relationship with each other and resort operations adjacent to them. With the improvement of transcontinental highways and easy access between the parks, the relationship of the park operators to each other and to the resort operations in their immediate vicinities has become of more and more importance. A visitor traveling from one park to another quite naturally expects to find facilities of the same general standard, and he also expects to find in a national park accommodations of the same general character as those outside at comparable rates. In order promptly to meet these new conditions

as they arise it was considered desirable that the rate schedules and service, as approved by the Secretary, have greater flexibility than heretofore.

With this purpose in mind and to enable the operators to respond more quickly to the constantly changing demands regarding service facilities for accommodating the public in the national parks, former Director Albright authorized the park operators under date of December 15, 1932, to offer new service facilities during the ensuing year and to make changes in existing service on approval by the respective superintendents and the Director.

The response of the public to this slight change in policy should result in a better understanding of service requirements with their attendant problems and provide information of value in planning future utility developments in the national parks.

The majority of the operators took advantage of this special authorization and numerous changes have been made during the year. European-plan rates were established to supplement the American-plan rates generally in use in hotels and lodges. Cafeteria service has supplemented or supplanted the regular meal service in many units. Meal rates were reduced in several of the parks. Special "club" or group rates were quoted for large parties visiting the parks and reductions were made for more or less extended stays and for off-season periods.

Despite these special inducements the amount of gross revenue from operations showed a still further decline. Complete reports are not available at this time, but it is estimated that the volume of 1933 business will aggregate about one third less than that of 1932, or about 15 percent of the volume of 1929. Although it has been necessary for the operators, because of this falling off in gross revenues, to effect drastic reductions in personnel and operating expenses, every effort has been made by them to maintain the high standard of service prevailing in the national parks.

I am glad to report that the operators have complied substantially with the requirements of the National Recovery Act.

For many years the most remunerative business of park operators has been the furnishing of accommodations to the visitors delivered to the various gateways of the parks by the transcontinental railroads. With the decline in railroad travel, many of the facilities acquired primarily to take care of the railroad business are more or less in disuse. Among such facilities not in operation during the 1933 season were the Mammoth and Lake Hotels and the Lake Lodge in Yellowstone National Park, the Cut-Bank and St. Mary's Chalets in Glacier National Park, and the Prince of Wales Hotel just outside of that park on Waterton Lake in Canada.

It was gratifying, however, to note that there was a perceptible improvement during the latter part of the season, and there is every indication that furnishing of accommodations for organized tours will again become quite a factor in the business of the public-utility operators.

RADIO COMMUNICATION

The experiments in two-way radio communication, begun in Mount Rainier National Park by R. D. Waterhouse, associate engineer, were continued during the past year with very satisfactory results. A full-time expert was employed during the summer season and the program had the following objectives:

1. Reliable communication between district ranger stations and headquarters to supplement interrupted telephone service.
2. The development of a light portable telephone set for use by smoke chasers and during fires.
3. Combined telephone and radio communication.

The first objective has been obtained with perfect success. Day after day, in all seasons and all kinds of weather, district rangers and fire lookouts have maintained regular communication with park headquarters.

A portable model has been developed and tested, but certain refinements and more power with less weight are being sought. The radio department of the University of Washington is cooperating in conducting research along these lines, and experimental sets are being constructed by the park radio division and two radio operators formerly employed in the park.

. Communication by means of combined use of the radio and telephone has been developed satisfactorily, and can be put into practical use whenever funds are available.

Experimental tests made between San Francisco, Seattle, and Mount Rainier Park, an airline distance of approximately 900 miles, resulted in code signals from the SP set in San Francisco being received with good volume in Seattle and the park. Voice signals from Seattle and the park were audible in the headphones with fair volume in San Francisco.

APPROPRIATIONS AND REVENUES

The appropriations made available to the National Park Service in the 1933 fiscal year totaled \$10,640,620, but in compliance with the restrictions contained in the Economy Act (Public No. 212,72d Cong.), and the act "To maintain the credit of the United States Government" (Public No. 2, 73d Cong.), the amount actually available for expenditure was reduced to \$10,319,272.54, or by \$321,347.46. Of the total appropriated, \$3,000,000 was provided for road and trail construction in the "Emergency Relief and Construction Act of

1932" approved July 21, 1932. In addition to the total appropriated funds indicated above, \$1,956,000 was made available for emergency conservation work during the fiscal year 1933, including \$770,000 allotted for work in State parks.

Cash donations to the national parks and national monuments for the fiscal year ended June 30, 1933, amounted to \$299,902.13. These funds were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditures of Federal appropriations. The revenues derived from the operation of the national parks and national monuments during the 1933 fiscal year amounted to \$628,182.06. In the 1932 fiscal year, cash donations amounted to \$14,828.50, and revenue receipts were \$820,654.19.

For the fiscal year 1934, \$5,072,790 was appropriated by the Interior Department Appropriation Act approved February 17, 1933, and \$180,000 in the Second Deficiency Act of March 4, 1933. Of these amounts and prior balances, only \$2,743,103.28 was released for actual expenditure, the balance being impounded. However, \$17,059,450 has been authorized for public-works projects by the Public Works Administration for construction of roads and trails, and \$2,145,000 for other physical-improvement projects. The public-works funds are available for the fiscal years 1934 and 1935. In addition, \$1,315,000 is programmed during the 1934 fiscal year for emergency conservation work.

PUBLIC WORKS

The allocation of funds under title II, section 205, of the National Industrial Recovery Act, assures continuation of greatly needed road and trail construction and the various types of other physical improvements which are required in the administration, protection, and maintenance of the national parks and national monuments. Approval of public-works projects, amounting to \$17,059,450 for road and trail work and \$2,145,000 for other physical improvements, will result in construction on an orderly program based upon advance planning and will afford maximum relief to the unemployed. The selection of projects will also provide the greatest possible spread among the far-flung parks and monuments under the jurisdiction of this Service.

For those agencies which were transferred to, and combined with, the former National Park Service under the Executive orders of June 10 and July 28, 1933, the Federal Emergency Administration of Public Works has approved construction of public-works projects amounting to \$1,222,573. Of this amount, \$25,000 is for improvement of the Statue of Liberty, in New York, formerly administered by the War Department, and \$1,197,573 is for projects in the District of Columbia under the former Office of Public Buildings and Public Parks of the National Capital.

CONCLUSION

As this report goes to press the Office of National Parks, Buildings, and Reservations is just finishing its reorganization and entering into a broader field of usefulness even than was possible under the older National Park Service.

It is hoped so to administer the expanded organization that all the functions included in it may continue in accord with the highest traditions of the past; and to eliminate, as experience points out the possibility, all overlapping of functions and waste motion.

In that connection, it is urgently recommended that the name "National Park Service" be given to the enlarged Bureau, instead of that of Office of National Parks, Buildings, and Reservations. Through the efforts of Stephen T. Mather and Horace M. Albright, the National Park Service gained Nation-wide acclaim as an outstanding Government Bureau that lived up to the highest concepts of service and conservation. The reorganization and resultant transfer to it of the military parks and monuments and the National Capital parks makes it more than ever a national park service. On the other hand, the name of "Office of National Parks, Buildings, and Reservations", in addition to its more cumbersome form, does not adequately express the purposes of the Bureau. Not only do many Government buildings remain outside its jurisdiction but it administers comparatively few of our Federal reservations, and those only of park and monument caliber. It is still distinctly a national park service with added responsibilities.

ALL INDIVIDUAL REPORTS OF SPECIAL UNITS ELIMINATED

In the interest of economy none of the customary information on the special field divisions and the individual national parks and monuments is being printed. Data regarding visitors, travel, campers, appropriations, and other statistics on parks and monuments follow:

NATIONAL PARKS TABLE 1.—*Holdings acquired for national park and monument purposes*

SUMMARIES OF BUREAU REPORTS

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Parks and monuments	Holdings acquired from July 1, 1932, through June 30, 1933				Total holdings acquired through June 30, 1933, in acres
	Holdings acquired by purchase	Donated funds	Area in acres	How acquired	
1. Acadia National Park					
2. Aztec Ruins National Monument	\$7,500.00	\$7,500.00	440.00	Donation.	452.79
3. Carlsbad Caverns National Park				Transferred from Navy Department.	440.00
4. Colonial National Monument					615.27
5. Crater Lake National Park	300.00		.25	Exchange.	240.00
6. Craters of the Moon National Monument					.25
7. General Grant National Park					240.00
8. George Washington Birthplace National Monument					20.00
9. Glacier National Park	7,900.00		160.00	Exchange.	160.00
10. Grand Canyon National Park					19,228.94
11. Great Smoky Mountains National Park					19,228.94
12. Hawaii National Park					297,719.70
13. Hot Springs National Park					156,800.00
14. Lassen Volcanic National Park					16.00
15. Mesa Verde National Park					40.00
16. Muir Woods National Monument					350.20
17. Petrified Forest National Monument					426.43
18. Pinnacles National Monument	19,080.00			Exchange.	3,194.00
19. Rocky Mountain National Park	3,200.00				3,194.00
20. Scotts Bluff National Monument					1,926.27
21. Sequoia National Park					4,538.93
22. Wind Cave National Park					4,798.93
23. Yellowstone National Park	477.50	477.50	38.20		162.08
24. Yosemite National Park	188,300.00	188,300.00	3,084.50		5,294.25
25. Zion National Park					3,294.25
26. Yucca House National Monument					100.77
Totals.	226,457.50	196,277.50	4,125.12		100.77
					2,375.88
					2,414.08
					30,547.48
					1,356.36
					9.60
					542,321.43
					27,856.12
					514,465.31

TRAVEL, FISCAL, AND MISCELLANEOUS STATISTICS

NATIONAL PARKS TABLE 2.—*Visitors to the national parks, 1918–33*

Name of park	1918	1919	1920	1921	1922	1923	1924	1925
Acadia.....		1 64,000	1 66,500	1 69,836	73,779	64,200	71,758	73,673
Crater Lake.....	13,231	16,645	20,135	28,617	33,016	52,017	64,312	65,018
General Grant.....	15,496	21,574	19,661	30,312	50,456	46,230	35,020	40,517
Glacier.....	9,086	18,956	22,449	19,736	23,935	33,988	33,372	40,063
Grand Canyon.....		37,745	67,315	67,485	84,700	102,166	105,256	134,053
Hawaii.....	(²)	(²)	(²)	1 16,071	27,750	41,150	52,110	64,155
Hot Springs.....	1 140,000	1 160,490	1 162,850	1 130,968	1 106,164	1 112,000	1 164,175	1 265,500
Lassen Volcanic.....	1 2,000	1 2,500	1 2,000	1 10,000	1 10,000	1 9,500	1 12,500	1 12,956
Mesa Verde.....	2,058	2,287	2,890	3,003	4,251	5,236	7,109	9,043
Mount McKinley.....	(²)	(²)	(²)	(²)	3 7	3 34	2 62	1 206
Mount Rainier.....	43,901	55,232	56,491	55,771	70,371	123,708	161,473	173,004
Platt.....	14,431	26,312	27,023	1 60,000	1 70,000	1 117,710	1 134,874	1 143,380
Rocky Mountain.....	101,497	169,492	240,966	1 273,737	4 219,164	218,000	224,211	233,912
Sequoia.....	15,001	30,443	31,508	28,263	27,514	30,158	34,468	46,677
Sullys Hill.....	4,188	4,026	9,341	9,100	1 9,548	8,478	8,035	9,183
Wind Cave.....	1 36,000	1 25,000	1 38,000	28,336	31,016	41,505	52,166	69,267
Yellowstone.....	21,275	62,261	79,777	81,651	98,223	138,352	144,158	154,282
Yosemite.....	33,497	58,362	68,906	91,513	100,506	130,046	105,894	209,166
Zion.....				3,692	2,937	4,109	6,408	8,400
Total.....	451,661	755,325	919,504	1,007,335	1,044,502	1,280,886	1,422,353	1,760,872
Name of park	1926	1927	1928	1929	1930	1931	1932	1933
Acadia.....	101,256	123,699	134,897	149,554	154,734	162,238	237,596	262,712
Bryce Canyon.....				21,997	35,982	41,572	34,143	32,878
Carlsbad Caverns ⁵					90,104	81,275	61,474	53,768
Crater Lake.....	86,019	82,354	113,323	128,435	157,693	170,284	109,738	96,512
General Grant.....	50,597	47,996	51,988	44,783	43,547	51,995	40,806	50,081
Glacier.....	37,325	41,745	53,454	70,742	73,776	63,497	53,202	76,715
Grand Canyon.....	140,252	162,356	167,226	184,093	172,763	156,964	121,267	105,475
Grand Teton.....				1 51,500	1 60,000	1 62,000	1 40,000	42,500
Great Smoky Mountains.....						1 154,000	1 300,000	1 375,000
Hawaii.....	1 35,000	37,551	78,414	109,857	89,578	124,932	139,663	237,690
Hot Springs.....	1 260,000	1 181,523	1 199,099	184,517	167,062	153,394	201,762	151,638
Lassen Volcanic.....	18,739	20,089	26,057	26,106	31,755	56,833	41,723	45,577
Mesa Verde.....	11,356	11,915	16,760	14,517	16,656	18,003	15,760	16,185
Morristown.....								1 25,000
Mount McKinley.....	1 533	4 681	4 802	1 038	951	771	357	386
Mount Rainier.....	161,796	200,051	219,531	217,753	265,620	293,562	216,065	170,104
Platt.....	1 124,284	1 294,954	1 280,638	1 204,598	1 178,188	6 825,000	200,471	220,606
Rocky Mountain.....	1 225,027	1 229,862	1 235,057	1 274,408	255,874	265,663	282,980	291,934
Sequoia.....	89,404	100,684	98,035	111,385	129,221	143,573	131,398	126,464
Sullys Hill.....	19,921	22,632	24,979	21,004	21,293	(?)	(?)	
Wind Cave.....	85,466	81,023	100,309	108,943	88,000	1 85,000	8 12,539	10,460
Yellowstone.....	187,807	200,525	230,984	260,697	227,901	221,248	157,624	161,938
Yosemite.....	274,209	490,430	460,619	461,257	458,566	461,855	498,289	296,088
Zion.....	21,964	24,303	30,016	33,383	55,297	59,186	51,650	48,763
Total.....	1,930,955	2,354,643	2,522,188	2,680,597	2,774,561	3,152,845	2,948,507	2,892,474

¹ Estimated.² No record.³ Actual park visitors; some miners and prospectors also passed through park.⁴ Indicated loss in travel from 1921 due largely to better methods of checking and estimating employed.⁵ National park established by act of May 14, 1930. Formerly a national monument.⁶ Much of this travel, which is estimated, originated in the locality.⁷ By act of Congress of Mar. 3, 1931, this area was transferred to the Department of Agriculture to be administered as a game preserve.⁸ Actual admissions to the Cave. Through travel over the park highway is estimated at 100,000 cars carrying 300,000 visitors.

SUMMARIES OF BUREAU REPORTS

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NATIONAL PARKS TABLE 3.—*Visitors to the national monuments, 1928–33*¹

Name	1928	1929	1930	1931	1932	1933
Arches (Utah)		² 500	² 400	² 405	² 480	1 425
Aztec Ruins (New Mexico)	18,359	18,193	12,906	10,710	8,322	7,546
Bandelier (New Mexico)					4,164	3,906
Canyon de Chelly (Arizona)				423	395	435
Capulin Mountain (New Mexico)	² 7,600	² 12,000	² 16,500	² 18,000	² 25,000	¹ 14,000
Carlsbad Cave (New Mexico)	46,335	76,822	(3)	(3)	(3)	(3)
Casa Grande (Arizona)	28,274	37,244	36,656	27,675	21,895	21,771
Chaco Canyon (New Mexico)	1,425	² 2,750	² 2,300	1,780	2,725	5,817
Colonial (Virginia)					⁴ 400,000	66,418
Colorado (Colorado)	² 10,000	² 12,000	² 13,000	² 16,000	² 18,000	¹ 20,000
Craters of the Moon (Idaho)	7,768	7,730	7,365	5,885	6,296	6,068
Devils Tower (Wyoming)	² 8,000	² 12,000	14,720	² 11,000	11,553	11,009
El Morro (New Mexico)	5,356	2,625	² 3,500	3,854	² 2,700	2,467
George Washington Birthplace (Virginia)			² 10,000	² 22,500	65,154	44,428
Gran Quivira (New Mexico)	2,779	3,357	4,812	4,232	3,844	3,563
Great Sand Dunes (Colorado)					² 500	1 550
Hovenweep (Utah-Colorado)	² 240	² 450	² 400	² 440	² 400	1 425
Montezuma Castle (Arizona)	16,232	17,824	19,298	14,411	² 14,000	13,899
Muir Woods (California)	103,571	93,358	77,311	73,717	50,746	39,568
Natural Bridges (Utah)	175	² 260	² 300	368	344	654
Navajo (Arizona)	315	965	215	² 300	² 300	1 375
Papago Saguaro (Arizona)	66,450	² 87,600	² 50,000	(3)	(3)	(3)
Petrified Forest (Arizona)	75,225	69,350	105,433	93,898	84,228	224,613
Pinnacles (California)	13,216	10,756	11,862	12,813	14,288	9,957
Pipe Spring (Arizona)	17,321	24,883	8,765	² 2,300	² 2,100	2,548
Rainbow Bridge (Utah)	² 200	² 450	325	² 350	² 325	1 385
Scotts Bluff (Nebraska)	² 37,500	² 42,500	² 48,500	² 48,000	² 45,000	1 49,500
Shoshone Cavern (Wyoming)	² 300					
Sitka (Alaska)	² 3,000	² 3,500	² 3,000	² 8,000	² 6,500	1 1,400
Tumacacori (Arizona)	17,341	18,250	15,603	12,036	13,753	8,869
Verendrye (North Dakota)	² 15,000	² 11,500	² 8,000	² 2,000	² 2,000	1 5,000
White Sands						12,000
Wupatki (Arizona)	² 500	² 550	684	² 650	² 850	1 1,250
Yucca House (Colorado)	174	² 250	² 240	264	² 240	1 300
Total	502,656	567,667	472,095	392,011	806,089	589,116

¹ No records for other national monuments.² Estimated.³ Made a national park by act of Congress approved May 14, 1930.⁴ Includes 225,000 attending Sesquicentennial celebration.⁵ National monument status of Papago Saguaro abolished by act of Congress approved Apr. 7, 1930.NATIONAL PARKS TABLE 4.—*Entries of private automobiles to the national parks during seasons 1926–33*¹

Name of park	1926	1927	1928	1929	1930	1931	1932	1933
Acadia ²	15,361	29,181	31,998	35,972	37,118	40,393	58,174	64,953
Bryce Canyon				5,223	10,007	11,734	10,469	9,450
Carlsbad Caverns ³					28,850	27,808	19,667	17,181
Crater Lake	26,442	25,667	34,869	39,043	51,020	56,189	36,465	28,443
General Grant	12,869	13,172	14,681	12,995	13,924	16,245	12,773	15,548
Glacier	6,727	7,980	9,860	14,320	18,318	16,415	14,150	20,483
Grand Canyon	22,849	28,479	32,316	37,848	39,572	39,844	33,103	27,562
Grand Teton				16,200	20,000	16,170	11,432	1 12,000
Great Smoky Mountains ²					⁴ 51,000	⁴ 55,000	¹ 100,000	
Hawaii ⁴	³ 6,500	8,345	14,505	18,347	28,251	31,026	32,204	70,221
Hot Springs ⁵	⁵ 1,539	⁵ 1,455	28,290	25,426	13,394	33,551	31,015	
Lassen Volcanic	5,423	5,899	8,137	8,370	9,896	18,273	12,910	13,349
Mesa Verde	3,054	3,315	4,803	4,224	5,023	5,334	4,914	4,991
Mount Rainier	38,626	48,275	50,005	51,998	62,866	74,947	54,180	42,866
Platt ²	45,796	⁴ 75,000	⁴ 70,000	⁴ 65,000	⁴ 71,500	⁴ 100,000	40,174	40,925
Rocky Mountain ²	³ 50,407	⁴ 54,109	⁴ 57,381	67,682	73,101	75,429	81,359	83,022
Sequoia ⁶	26,503	30,165	29,290	33,250	39,631	44,701	40,820	41,855
Sullivans Hill ²		4,484	4,700	5,229	4,936	4,284	(7)	(7)
Wind Cave ²	28,332	26,879	33,300	36,317	⁴ 20,000	⁴ 25,000	⁸ 4,500	3,500
Yellowstone	⁵ 44,326	49,055	58,186	68,415	63,588	63,795	46,846	47,042
Yosemite	74,885	137,296	131,689	132,903	141,267	151,126	161,909	99,423
Zion	4,796	6,203	7,532	8,612	15,633	18,215	16,180	14,980
Total	417,380	555,279	595,236	689,945	779,275	897,038	810,780	788,809

¹ Automobiles and motorcycles entering parks with or without licenses, to and including Sept. 30, 1932.² No license required.³ National park established by act of May 14, 1930; formerly a national monument.⁴ Estimated.⁵ Count made only at public camp ground.⁶ License required only for Giant Forest Road.⁷ By act of Congress of Mar. 3, 1931, this area was transferred to the Department of Agriculture to be administered as a game preserve.⁸ Estimated; approximately 100,000 cars went over park highway during 1932 season, but only 4,500 cars (estimated) were used by persons actually entering the cave.

NATIONAL PARKS TABLE 5.—*Automobile and motorcycle licenses issued during seasons 1929–33*

Name of park ¹	1929		1930		1931		1932		1933	
	Auto-mobiles	Motor-cycles	Auto-mobiles	Motor-cycles	Auto-mobiles	Motor-cycles	Auto-mobiles	Motor-cycles	Auto-mobiles	Motor-cycles
Crater Lake.....	23,954	46	37,595	10	35,716	51	29,637	—	19,924	—
General Grant.....	6,028	—	7,199	—	7,397	—	5,900	—	6,190	—
Glacier.....	7,577	—	10,498	7	11,362	—	10,712	11	8,955	10
Grand Canyon.....	29,229	—	33,750	—	36,797	—	32,651	—	30,104	—
Lassen Volcanic ²	—	—	—	—	—	—	4,803	3	4,924	9
Mesa Verde.....	3,926	9	4,599	—	4,863	—	4,382	—	4,262	—
Mount Rainier.....	32,184	61	35,498	28	41,217	16	44,719	—	31,903	—
Sequoia ³	16,799	—	20,998	—	21,802	—	18,304	—	17,045	—
Yellowstone.....	56,150	159	63,853	187	56,401	176	52,597	155	38,580	46
Yosemite.....	74,229	167	81,365	186	76,678	175	67,482	129	61,742	118
Zion.....	6,822	—	10,284	—	15,754	—	12,967	—	12,194	—
Total.....	256,898	442	305,669	418	307,987	418	284,154	298	235,832	183

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

Licenses not required in certain parks because of small road mileage or unimproved condition of roads (see footnote 1). Licenses also not required for travel on unimproved roads in other parks. No charge for license issued for operating cars on official business.

NATIONAL PARKS TABLE 6.—*Receipts collected from automobiles and motorcycles during seasons 1929–33*

Name of park ¹	1929	1930	1931	1932	1933
Crater Lake.....	\$24,000.00	\$37,623.00	\$35,803.00	\$29,687.00	\$19,924.00
General Grant.....	3,014.00	3,599.50	3,698.50	2,950.00	3,099.50
Glacier.....	7,577.00	10,506.00	11,362.00	11,092.00	8,965.00
Grand Canyon.....	29,300.00	33,988.00	36,950.00	32,764.00	30,104.00
Lassen Volcanic ²	—	—	—	5,778.50	4,928.50
Mesa Verde.....	3,944.00	4,644.00	4,917.00	4,396.00	4,262.00
Mount Rainier.....	32,245.00	35,526.00	41,233.00	44,719.00	31,903.00
Sequoia ³	16,799.00	20,998.00	21,802.00	18,304.00	17,045.00
Yellowstone.....	168,608.00	192,218.00	169,379.00	156,537.00	115,786.00
Yosemite.....	148,613.00	162,784.00	153,531.00	135,831.00	123,602.00
Zion.....	3,431.50	7,521.00	15,400.00	12,976.00	12,194.00
Total.....	437,531.50	509,407.50	494,075.50	455,034.50	371,813.00

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years ¹*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1928.....	\$37,940.00	\$37,376.99	—
1929.....	39,000.00	—	
1929 (deficiency).....	1,355.00	40,014.00	—
1930.....	52,600.00	48,701.52	—
1931.....	59,900.00	56,984.42	—
1932.....	61,600.00	2 59,892.14	—
1933.....	59,400.00	57,602.08	10.00
1934.....	55,000.00	—	
Bryce Canyon:			
1930.....	26,100.00	21,580.01	—
1931.....	13,700.00	13,700.00	—
1932.....	20,000.00	2 19,257.50	—
1933.....	14,800.00	12,455.43	—
1934.....	13,790.00	—	

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Carlsbad Caverns National Park:			
1928	\$30,000.00	\$28,492.84	\$55,682.00
1929	70,000.00		
1929 (deficiency)	260.00		
1930	100,000.00	103,271.01	136,241.78
1931	165,600.00	124,220.75	143,779.55
1932	150,100.00	2 130,162.62	113,677.43
1933	128,800.00	4 135,687.63	77,236.57
1934	68,330.00		
Crater Lake:			
1928	63,590.00	62,382.53	22,927.69
1929	47,100.00		
1929 (deficiency)	850.00	3 61,464.00	24,318.22
1930	59,800.00	67,938.75	38,023.70
1931	12,000.00		
1932	3 73,300.00	73,551.96	35,843.15
1933	106,900.00	106,753.64	29,687.00
1934	90,000.00	86,554.37	19,924.00
General Grant:			
1928	13,650.00	13,529.26	3,488.90
1929	15,650.00		
1929 (deficiency)	500.00	15,802.00	3,305.70
1930	15,650.00	15,448.14	3,868.28
1931	15,860.00	15,841.07	3,989.95
1932	21,900.00	21,881.86	3,973.22
1933	21,900.00	20,913.85	3,437.16
1934	15,000.00		
Glacier:			
1928	163,300.00	162,525.28	14,652.59
1929	188,200.00		
1929 (deficiency)	5,065.00	191,061.00	18,436.18
1930	219,400.00	215,726.91	22,146.16
1931	227,000.00		
1931 (deficiency)	9,550.00	223,956.32	17,866.46
1932	256,500.00	2 246,002.11	17,495.56
1933	226,200.00	224,744.51	12,006.64
1934	201,803.00		
Great Smoky Mountains:			
1930-31 (deficiency)	30,000.00	25,193.31	76.00
1932	30,000.00	2 29,682.77	5,220.55
1933	30,000.00	27,959.52	5,140.69
1934	28,430.00		
Grand Canyon:			
1928	128,760.00	128,268.33	46,097.43
1929	169,000.00		
1929 (deficiency)	3,540.00	151,813.00	49,078.33
1930	145,000.00	141,389.56	55,684.46
1931	153,600.00	3 171,670.11	51,497.05
1932	172,200.00	2 168,106.43	40,221.18
1933	150,000.00	142,656.15	32,933.93
1934	135,890.00		
Grand Teton:			
1929			25.00
1930			70.00
1931	30,700.00	29,048.47	20.00
1932	76,750.00	2 73,180.80	73.80
1933	29,900.00	26,243.06	45.00
1934	20,000.00		
Hawaii:			
1928	18,250.00	18,119.10	1,450.00
1929	21,500.00		
1929 (deficiency)	785.00	21,070.00	1,477.00
1930	27,400.00	25,700.05	1,532.52
1931	35,800.00	35,439.55	1,500.00
1932	54,600.00	54,594.06	1,493.41
1933	51,100.00	50,095.20	482.46
1934	48,079.00		
Hot Springs:			
1928	69,800.00	67,433.19	47,695.50
1929	68,000.00		
1929 (deficiency)	6,320.00	71,970.00	47,930.90
1930	70,900.00	69,173.38	47,931.33
1931	218,500.00	194,760.18	50,467.80
1932	89,300.00	2 86,110.72	43,243.22
1933	87,700.00	82,359.03	38,263.90
1934	82,680.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Lassen Volcanic:			
1928	\$15,625.00	\$15,448.52	\$167.84
1929	22,400.00	22,688.00	34.36
1929 (deficiency)	460.00		
1930	25,300.00	25,061.16	3,039.55
1931	30,500.00	29,007.20	51.59
1932	50,300.00	2 49,774.20	5,778.50
1933	45,100.00	43,310.99	4,980.96
1934	28,334.00		
Mesa Verde:			
1928	50,750.00	48,343.59	3,342.80
1929	83,000.00	3 78,134.00	4,719.00
1929 (deficiency)	1,115.00		
1930	57,000.00	53,910.66	4,870.62
1931	96,800.00	4 95,799.70	5,411.27
1932	57,300.00	2 55,724.49	5,011.75
1932 (deficiency)	22,000.00		
1933	72,900.00	4 91,693.26	4,750.50
1934	52,509.00		
Mount Rainier:			
1928	108,000.00	105,447.74	32,495.50
1929	141,000.00	3 141,285.00	39,233.17
1929 (deficiency)	3,370.00		
1929-30 (deficiency)	2,500.00		
1930	122,600.00	125,214.00	41,530.31
1931	180,900.00	174,823.33	46,034.89
1932	195,000.00	1 263,233.48	48,793.27
1931-32 (deficiency)	71,000.00		
1933	227,100.00	214,501.02	33,506.96
1934	143,884.00		
Mount McKinley:			
1928	22,000.00	21,314.12	63.04
1929	35,900.00	3 36,165.00	1.00
1929 (deficiency)	740.00		
1930	40,000.00	37,680.26	213.18
1931	46,700.00	42,686.45	292.00
1932	31,100.00	28,157.21	129.66
1933	35,600.00	32,165.49	25.00
1934	28,480.00		
Platt:			
1928	13,050.00	12,991.87	77.16
1929	18,000.00	19,053.00	33.05
1929 (deficiency)	1,080.00		
1930	16,200.00	16,178.70	
1931	18,500.00	18,269.14	
1932	35,900.00	2 35,506.83	
1933	31,600.00	30,333.10	
1934	28,520.00		
Rocky Mountain:			
1928	97,620.00	95,612.07	924.12
1929	95,500.00	3 95,230.00	1,537.07
1929 (deficiency)	2,380.00		
1930	96,000.00	94,871.34	4,471.24
1931	105,950.00	104,880.57	448.45
1932	118,800.00	2 117,909.55	749.58
1933	114,300.00	111,361.48	1,046.41
1934	98,007.00		
Sequoia:			
1928	109,000.00	108,863.10	35,105.83
1929	113,000.00	3 114,626.00	30,753.00
1929 (deficiency)	3,440.00		
1930	130,000.00	130,056.49	33,934.54
1931	113,100.00	111,513.95	35,694.49
1932	156,900.00	156,713.93	33,010.38
1933	131,800.00	129,146.15	30,189.77
1934	113,317.00		
Shenandoah (proposed):			
1934	6 80,000.00		
Wind Cave:			
1928	10,850.00	11,500.00	12,725.50
1929	11,000.00	3 11,744.00	13,178.17
1929 (deficiency)	760.00		
1930	13,500.00	13,442.51	16,715.01
1931	54,900.00	46,271.94	11,968.43
1932	25,200.00	2 68,074.68	7,258.68
1931-32 (deficiency)	50,000.00		
1933	20,600.00	20,345.64	5,056.19
1934	18,160.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Yellowstone:			
1928	\$400,000.00	3 \$399,150.00	\$251,663.11
1929	434,000.00	3 443,230.00	289,388.95
1929 (deficiency)	12,230.00		
1930	453,000.00	3 463,306.47	317,238.17
1930 (deficiency)	17,000.00		
1931	501,275.00	500,026.39	259,723.33
1932	560,800.00	2 536,739.83	228,644.39
1933	530,800.00	497,681.85	149,853.87
1934	466,309.00		
Yosemite:			
1928	301,000.00	4 257,363.73	276,438.20
1928 (deficiency)	15,000.00		
1929	387,250.00	3 449,159.00	237,166.90
1929 (deficiency)	14,385.00		
1930	412,360.00	4 390,204.38	280,355.45
1930 (deficiency)	5,381.00		
1931	510,100.00	574,302.64	260,805.28
1931 (deficiency)	32,500.00		
1932	558,600.00	2 535,376.25	222,629.17
1933	401,200.00	389,523.19	196,319.94
1934	335,309.00		
Zion:			
1928	30,900.00	30,737.69	3,106.50
1929	38,000.00	40,569.00	3,576.50
1929 (deficiency)	3,295.00		
1930	38,300.00	3 42,290.11	7,724.01
1931	33,200.00	3 32,589.60	15,500.50
1932	54,100.00	2 53,145.65	13,067.30
1933	46,600.00	45,451.53	12,194.00
1934	47,440.00		
George Washington B.P. National Monument:			
1930 (deficiency)	996.18	987.71	
1930-31 (deficiency)	80,000.00	78,782.34	
1931	2,500.00		
1932	26,500.00	2 26,050.83	1.00
1933	25,800.00	22,661.61	20.00
1934	21,250.00		
Colonial National Monument:			
1931-32 (deficiency)	135,000.00	2 132,648.99	299.95
1933	72,000.00	53,615.41	504.92
1934	52,030.00		
Protection of National Monuments:			
1928	25,000.00	24,042.56	132.00
1929	35,000.00	35,951.00	97.00
1929 (deficiency)	1,225.00		
1930	46,000.00	4 42,634.76	100.00
1931	53,900.00	71,598.75	269.60
1931 (deficiency)	3,000.00		
1932	165,400.00	4 147,585.89	195.19
1933	93,800.00	4 86,978.64	252.05
1934	89,060.00		
National Park Service:			
1928	57,100.00	57,047.56	20.10
1929	70,200.00	3 75,714.00	
1929 (deficiency)	4,660.00		
1930	80,830.00	81,864.36	.25
1931	117,000.00	115,859.20	
1932	167,400.00	165,299.20	
1933	174,620.00	174,547.94	1.14
1934	160,000.00		
Fighting forest fires:			
1922	25,000.00	9,618.30	
1923	25,000.00	17,764.16	
1924	25,000.00	6,526.02	
1925	20,000.00	20,000.00	
General expenses, National Park Service:			
1931	25,000.00	24,993.02	
1932	35,100.00	31,904.58	
1933	37,000.00	33,914.87	
1934	25,000.00		
Emergency reconstruction: 1925	20,000.00	17,009.15	

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statements of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Forest protection and fire prevention:			
1931	\$96,850.00	\$95,856.95	
1932	170,000.00	³ 167,247.75	
1933	140,000.00	132,491.82	
1934	147,000.00		
Emergency reconstruction and fighting forest fires:			
1926	40,000.00		
1926 (deficiency)	40,000.00	80,000.00	
1927	40,009.00	40,000.00	
1927 (deficiency)	235,000.00	228,647.83	
1928	40,000.00	26,865.46	
1929 (deficiency)	29,000.00	⁴ 40,138.26	
1930	20,000.00		
1930 (deficiency)	180,000.00	180,300.17	
1931	50,000.00	40,481.49	
1932	50,000.00	⁴ 169,950.35	
1932 (deficiency)	55,000.00		
1933	50,000.00	⁴ 57,228.83	
1934	150,000.00		
Construction of roads and trails:			
1925 (deficiency)	1,000,000.00	1,000,000.00	
1926	1,500,000.00	1,500,000.00	
1927	2,000,000.00	2,000,000.00	
1928	2,000,000.00	2,000,000.00	
1928 (deficiency)	1,000,000.00	1,000,000.00	
1929	2,500,000.00	2,500,000.00	
1930	5,000,000.00	5,000,000.00	
1931	5,000,000.00	⁷ 5,000,000.00	
1931 (deficiency)	2,500,000.00		
1932	5,000,000.00	5,000,000.00	
1933	4,500,000.00	4,500,000.00	
1934	2,435,700.00		
Emergency construction, roads and trails:			
1931 (deficiency)	2,078,800.00	2,078,800.00	
1933	3,000,000.00	3,000,000.00	
Insect control:			
1925-26 (deficiency)	25,000.00	24,945.24	
1927	20,000.00	19,828.96	
1928	7,500.00	7,379.35	
Southern Appalachian:			
1925-26 (deficiency)	20,000.00	12,453.27	
1927	(⁴)	7,252.21	
1928	5,000.00	⁴ 3,887.13	
1929	4,500.00	⁴ 3,945.07	
1930	3,000.00	⁴ 3,415.75	
1931	3,000.00	⁴ 4,172.45	
Purchase of lands:			
1928	50,000.00	13,925.00	
1929	50,000.00	1,383.00	
1930	250,000.00	17,233.93	
1931	1,750,000.00	⁵ 1,983,718.06	
1932	1,000,000.00	⁴ 711,688.33	
1933		⁵ 238,396.19	
Extension of winter-feed facilities:			
1930	75,000.00	7,612.50	
1931	75,000.00	10,265.00	
1932		⁵ 12,022.50	
1933		⁵ 477.50	
Purchase of lands Colonial National Monument:			
1931-32 (deficiency)	500,000.00	500,000.00	
Public works projects, roads and trails:			
1933-35	17,059,450.00		
Public works projects, physical improvements:			
1933-35	2,145,000.00		
Emergency conservation work:			
1933-34 (allotments program)	3,271,000.00		

¹ For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354-358, and for 1918-27 see 1930 Annual Report, pp. 66-72.

² Appropriation decreased by transfers to emergency reconstruction and fighting forest fires under authority contained in the appropriation act. (See table 18.)

³ Appropriation augmented by transfers from other appropriations under 10 percent clause.

⁴ Reappropriated items. (See table 14.)

⁵ Available until expended.

⁶ Not available until park is established.

NATIONAL PARKS TABLE 8.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reap- propri- ated for fiscal year	Park	Amount	Purpose
1928.....	1929	Yosemite.....	\$35,000.00	Hospital building.
1928.....	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928.....	1929	Emergency reconstruc- tion and fighting forest fires.....	13,134.54	Do.
1929.....	1930	Yosemite.....	8,661.78	Construction of water-supply and camp- ground facilities.
1929.....	1930	Carlsbad Caverns.....	4,950.00	Superintendent's residence.
1929.....	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929.....	1931	Grand Canyon.....	20,000.00	Hospital building.
1930.....	1931	Acadia.....	2,850.00	Equipment storage building.
1930.....	1931	Crater Lake.....	1,091.06	Ranger station.
1930.....	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930.....	1931	Yosemite.....	32,662.70	Physical improvements.
1930.....	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930.....	1931	Southern Apalachian.....	1,246.80	To remain available; general.
1930.....	1931	Glacier.....	9,550.00	One third of cost of constructing a tele- phone line.
1931.....	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931.....	1932	Emergency reconstruction and fighting forest fires.....	7,434.15	To remain available; general.
1931.....	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932.....	1933	Carlsbad Caverns.....	13,000.00	Electric system, extension and improve- ment.
1932.....	1933	Emergency reconstruction and fighting forest fires.....	16,587.00	To remain available; general.

NATIONAL PARKS TABLE 9.—*Summary of appropriations for the administration,
protection, and improvement of the national parks and national monuments,
together with the revenues received, for the fiscal years 1917¹–33, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department..... War Department.....	\$537,366.67 247,200.00	
1918	Interior Department..... War Department.....	530,680.00 217,500.00	\$784,566.67 \$180,652.30
1919	Interior Department..... War Department.....	963,105.00 50,000.00 50,000.00	748,180.00 ² 217,330.55
1920		1,013,105.00 907,070.76	196,678.03 316,877.96
1921		1,058,969.16	396,928.27
1922		1,433,220.00	432,964.89
1923		1,446,520.00	513,706.36
1924		1,892,601.00	663,886.32
1925		3,027,657.00	670,920.98
1926		3,258,409.00	826,454.17
1927		3,698,920.00	703,849.60
1928		4,889,685.00	808,255.81
1929		4,754,015.00	849,272.95
1930		7,813,817.18	1,015,740.56
1931		12,113,435.00	940,364.79
1932		12,831,250.00	820,654.19
1933		10,640,620.00	628,182.06
1934		27,728,240.00	-----

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 10.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686.	1925	\$1,000,000		\$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179.	1926	1,500,000	² \$1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491.	1927	2,000,000	² 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966.	1928	2,000,000	² 2,500,000	
First Deficiency act, Dec. 22, 1927; 45 Stat. 19.		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237.	1929	2,500,000	² 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601.	1930		² 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319.		5,500,000		
Act Dec. 20, 1930; emergency construction.	1931	1,500,000	² 2,500,000	
Emergency construction funds transferred by the President.		578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115.	1932	5,000,000	² 2,850,000	
Second Deficiency act 1931; Mar. 4, 1931.		2,500,000		7,850,000
Act Apr. 22, 1932 47 Stat. 126, 127.	1933	4,500,000	³ 2,500,000	7,150,000
Emergency construction and relief.		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853.	1934	2,435,700		64,300
Total appropriated.		\$39,514,500		
Total program to date.				\$39,514,500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

GEOLOGICAL SURVEY

(WALTER CURRAN MENDENHALL, Director)

The appropriations made directly for the work of the Geological Survey for the fiscal year 1933 included 12 items, amounting to \$2,181,000. Of the balance remaining in the 1932 appropriation for topographic surveys, \$150,000 was continued available for expenditure during the fiscal year 1933, and the sum of \$284,400 was transferred to the Geological Survey under the provisions of section 317 of the legislative appropriation act of June 30, 1932, making a total of \$2,615,400 available for expenditure. In addition, \$12,424.50 for miscellaneous supplies was allotted from appropriations for the Interior Department.

A detailed statement of the amounts appropriated and expended is given at the end of the report. The balance on July 31 was \$192,265.07.

The total amount of funds made available for disbursement by the Geological Survey, together with State funds directly disbursed for work administered by the Federal officials, was \$4,032,552.62.

THE YEAR'S OPERATIONS

Geological work.—The geologic work done during the year included economic and general studies of metal-mining districts in Colorado, Idaho, Nevada, New Mexico, Utah, and Virginia; of coal fields in Montana, Utah, and New Mexico; of oil and gas fields in Kansas, California, Montana, Colorado, and Utah; and of phosphate, oil shale, and other mineral deposits in Wyoming. In much of this work State surveys and other organizations cooperated. One of the most notable achievements of the year was the completion and publication of the new geologic map of the United States on the scale of 1 : 2,500,000. Potash investigations were continued as part of the regular work, no special funds being available. Cuttings from oil wells and samples from private core tests on Government permit areas were studied mineralogically and petrographically, and the analyses and other tests for potash numbered 2,445. This work disclosed a third source of commercial sylvite in New Mexico. Areal mapping or other general geologic work was done in 30 States and volcanologic work in Hawaii.

Explorations in Alaska.—In the season of 1932 eight field projects in Alaska resulted in the geologic mapping of 2,730 square miles and the topographic mapping of 3,571 square miles. On one of these projects the Alaska Railroad cooperated. Of the total area of Alaska 44.8 percent has now been covered by geologic surveys and 47.8 percent by topographic surveys. The usual general survey of recent mining developments, collection of mineral statistics, and supervision of operations under coal and oil leases on Government lands were continued. Three field projects for the season of 1933 had been started at the end of the

fiscal year. The work done in cooperation with the Alaska Railroad included, in addition to the survey project already mentioned, core drilling to test two coal areas in the railroad belt. This work indicated that the areas do not warrant development under present conditions. In the office a little more than 1,000 square miles of new drainage base was compiled from aerial photographs taken by the Navy Department in 1926 and 1929.

Topographic mapping.—The area mapped topographically during the year amounted to 20,191 square miles and the total area now mapped, exclusive of Alaska, is 1,387,207 square miles. Ten States, the District of Columbia, and Hawaii are completely mapped, and the percentages in the other States range from 8 in Florida to 88.9 in Virginia. Of the continental United States, exclusive of Alaska, 45.6 percent has been mapped. Cooperative funds furnished by States for topographic mapping during the year amounted to \$370,309.71 and came from 16 States and 2 counties. Cooperation was also rendered by the War Department and the Department of Justice. The office work included the completion of stereophotogrammetric mapping from aerial photographs of Bryce Canyon National Park, the mounting of 4,000 multiple-lens photographs for the Guatemala-Honduras Boundary Tribunal, corrections to State maps for use in assembling a map of the Tennessee River Basin, and other routine or special projects.

Investigation of water resources.—The work on water resources is done largely in cooperation with other Government organizations, with State, county, and municipal agencies, and with permittees and licensees of the Federal Power Commission. The amount expended by State, county, and municipal agencies for such work during the year, in part directly and in part through the Geological Survey, was \$524,988.53. Including the cooperative work, the study of surface waters, which consists primarily of the measurement of the flow of streams, was carried on in 48 States, the District of Columbia, and Hawaii, in which at the end of the year 2,801 gaging stations were being maintained. In this work 40 of the States and Hawaii cooperated. Investigations relating to ground water or power and reservoir sites were made in 19 States and Hawaii. The number of water-stage recorders in operation over observation wells has now reached 125. In the hydrologic laboratory 496 samples of water-bearing material were analyzed. The work on quality of water involved the examination of 1,034 samples of water. Studies of the dissolved and suspended matter in the Colorado River and its tributaries were continued. The investigations of power resources included the preparation of monthly and annual reports on the production of electricity and consumption of fuel by public-utility power plants, a report on the developed waterpower of the United States, and compilations of the stocks of coal held by electric public-utility power plants. The studies of water utilization and flood control included investigations relating to the apportionment of water on international streams and studies of the effect of a dam in Canada on the behavior of surface and ground water in the United States. Special field work was done in connection with 120 projects of the Federal Power Commission.

Classifying and leasing public lands.—The classification of public lands with respect to their mineral, waterpower, and agricultural value, and the technical supervision of mineral and power development on such lands and of mineral development on Indian lands, were continued in 21 States and Alaska. The number of cases involving land classification, acted on during the year was 12,568, and the results accomplished include net decreases of 597,479 acres in outstanding withdrawals for coal and of 356 acres in outstanding withdrawals for oil and a net increase of 191,851 acres in areas classified as coal land. At the end of the year the total area classified as mineral in character amounted to 37,081, 414 acres in 14 States and Alaska, and the outstanding mineral with-

drawals to 50,918,765 acres in 14 States. Definition of the "known geologic structure" of producing oil and gas fields was continued, and at the end of the year the net area so defined was 944,951 acres in 7 States. Investigations to obtain information for classifying public land with respect to its value for the development of waterpower were made in 2 States. There was a net increase of 105,625 acres in the area included in power reserves, making a total of 6,682,810 acres in 21 States and Alaska, on which about 15,000,000 continuous horsepower can be developed. The net decrease in enlarged-homestead designations was 4,850,782 acres, making a total outstanding of 309,498,084 acres in 14 States, and the net increase in stock-raising homestead designations was 705,440 acres, making a total outstanding of 124,302,026 acres in 19 States. There was a net increase of 39,365 acres in public water reserves, and the total outstanding is now 487,201 acres in 12 States and Alaska.

The supervisory work on public lands subject to the mineral leasing laws was increased by the issuance of 71 leases, 32 licenses, and 1,180 permits, and decreased by 646 cancellations and expirations of leases, permits, and licenses. The production of petroleum on such lands during the year was 24,662,589.46 barrels, of natural gas 56,637,196,000 cubic feet, and of gasoline 91,549,635.62 gallons, on which the royalty, rentals, and bonuses amounted to \$3,292,712.38. The production of coal on such lands was 2,947,384 tons, of phosphate rock 1,643.04 tons, of potash 173,563.16 tons, and of sodium salts 37,314 tons, on which the royalty, rentals, and bonuses amounted to \$356,264. Supervision over oil and gas operations on naval petroleum reserves was continued, and the total production was 3,672,408.11 barrels of petroleum, 3,917,098,000 cubic feet of natural gas, and 15,876,707 gallons of gasoline, on which the royalty value was \$706,107.47. Inspectional, regulatory, and advisory service was rendered in connection with the leasing of mineral deposits on Indian lands in eight States.

Publications.—The publications of the year consisted of 53 books and pamphlets of the regular series, 29 guidebooks for the excursions of the International Geological Congress, 99 new or revised maps, 149 reprinted maps, 1 geologic folio, and numerous circulars, lists of publications, etc. The total number of pages in the new book publications, including the guidebooks, was 10,572. In addition to these publications, 48 brief papers, several of them accompanied by maps, were issued in mimeographed form as memoranda for the press. The publications distributed numbered 712,904, of which 3,776 folios and 477,867 maps were sold for \$29,969.21.

GEOLOGICAL BRANCH

Geologic work in the usual classes of economic surveys and investigations and general or special research problems was actively carried on throughout the year, but the amount of field work done was considerably less than in recent years. Rigid economy was necessary because the total available funds for the work of the geologic branch for the year were about \$100,000 less than for the fiscal year 1932. Many geologists who ordinarily spend 3 to 5 months of each year in field work remained in the office and prepared reports on projects that had previously been investigated in the field.

The preliminary uncolored edition of the geologic map of Texas was printed early in the year and was distributed to geologists and oil companies of the region for criticism and correction. The compilation of the resultant new data for the map in its final colored form is nearing completion, but lack of funds for engraving and printing may

postpone publication for some time. The publication in June of a new geologic map of the United States on the scale of 1:2,500,000 is one of the most notable achievements of the year. An important continuous service to the public is rendered in the geologic branch by the identification of rocks, ores, minerals, and fossils and by carefully prepared letters in answer to numerous daily inquiries on geologic topics.

WORK OF THE YEAR, BY STATES

Alabama.—Studies of the brown iron ores of the Russellville district and of the iron ore in the Red Mountain formation in northeastern Alabama, cooperative projects with the Geological Survey of Alabama, were continued. A report on Iron Ore in the Red Mountain Formation in Greasy Cove was issued as circular 1.

Arizona.—The guidebook of the Southern Pacific lines, New Orleans to Los Angeles, was completed for publication as Bulletin 845. Geologic investigations included field mapping of the Tucson quadrangle, brief examination of manganese deposits near Artillery Peak, study of the geology and ore deposits of the Ajo copper district, and examination of a dam site in the San Carlos project for the Office of Indian Affairs.

Arkansas.—Field work in the Ouachita Mountains of Oklahoma and Arkansas was continued. A preliminary report on the cooperative study of the zinc and lead deposits of northern Arkansas was issued during the year, and work on a paper on recent developments in the Batesville manganese district was completed. Stratigraphic and paleontologic studies included the Morrow formation and the Batesville sandstone, echinoderm microfaunas from the Mississippian, microfossils from the Carboniferous, and Wedington flora of the Fayetteville shale and of the Jackfork standstone and Stanley shale.

California.—The study of the Kettleman Hills oil and gas field was continued. Field work in the San Pedro Hills was begun, and field work on the siliceous sediments and associated rocks of the Monterey group was completed. Studies of source rocks of petroleum in several oil fields of southern California were continued. Office work was also continued on the reports on the Ivanpah quadrangle, on the Grass Valley district, and chromite deposits in northern California. Studies were continued on the San Andreas rift and the southern part of Death Valley. Work was prosecuted in connection with the report on the geomorphology of the upper San Joaquin Basin.

Colorado.—Study of the mining regions of the State was continued in cooperation with the Geological Survey Board of Colorado and the Colorado Metal Mining Fund, though the work was curtailed owing to decrease of funds. A general report on the geology and ore deposits of the State is in preparation to accompany the geologic map, which is now almost ready for engraving. An intensive field study was made of the Arrastre Basin of the San Juan region, and the report was sent to the Colorado Scientific Society for publication. Field work was carried on in the Jamestown district, in the Snowmass area and in the Nederland tungsten area. A study of the Independence Pass district was made with special reference to the driving of tunnels for diversion of water from the west to the east slope of the Continental Divide.

The geologic mapping of the Tertiary and Upper Cretaceous formations of eastern Colorado, north of the Arkansas River and south of the Platte River, was completed and progress was made on a detailed report.

Florida.—Studies were continued of pelecypods and gastropods from the Alum Bluff group (Miocene) including work on the preparation of the report on the Tampa limestone (Miocene), in cooperation with the Florida Geological Survey.

Hawaii.—The work of the section of volcanology at Volcano House, Hawaii National Park, was carried on during the year and included observing volcanoes, operating local seismographs, doing oceanographic work, especially on tidal waves, measuring horizontal and vertical movements of the ground by surveying methods, building and improving instruments of research for volcano and earthquake study, carrying on special researches for publication suggested by the back records, etc. At Lassen, Calif., other systematic measurements include hot-spring temperatures and land slipping. The Hawaiian Volcano Research Association has assisted the Geological Survey in the past and carried all the expenses of the Hawaiian station except salaries of the professional staff in 1933.

Idaho.—Studies of some mining districts in Idaho were continued in cooperation with the Idaho Bureau of Mines and Geology. Field work was done in the Buffalo Hump, Elk City, and adjoining districts, and several reports were prepared. Work in the Boise Basin in the Yellow Pine, Edwardsburg, and Thunder Mountain districts was prosecuted. A report on some lode deposits in the northwestern part of the Boise Basin is ready for publication.

Illinois.—Work on the Pottsville fossil floras of the eastern interior coal basin of Illinois, including small areas in adjoining States, which is being carried on in cooperation with the Illinois Geological Survey, was well advanced.

Indiana.—The Survey continued its work on new crinoid genera from the Mississippian, Devonian, and Silurian.

Iowa.—Studies of the typical Kinderhook fauna were continued.

Kansas.—A report on the origin of the shoestring oil sands of Greenwood and Butler Counties and adjacent areas was completed. This is a cooperative project between the State and Federal surveys.

Kentucky.—A report on fossil flora of the New Providence shale with notes on a new representative of the Calamopityeae from Junction City is in preparation.

Louisiana.—Studies of the cap rock of salt domes of southern Louisiana were continued. The Southern Pacific Guidebook is noted under Arizona.

Maine.—The Geological Survey cooperated with the State geologist of Maine in the preparation of a State geologic map, which will be issued by the State.

Maryland.—Work on the geology of the Appalachian Mountain region of Maryland, in cooperation with the Maryland Geological Survey, was continued.

Massachusetts.—A field and office review of the stratigraphy and structure of the Taconic quadrangle were made in connection with general geologic studies in the region.

Michigan.—The preparation of material for a revised report on the Lake Superior iron-ore region was continued.

Minnesota.—See Michigan: Lake Superior iron-ore region.

Mississippi.—A report on the geology of the Jackson, Florence, and Pela-hachee quadrangles is in preparation. A study of Cretaceous volcanism and structural history of the Jackson gas field was inaugurated.

Missouri.—Informal cooperation with the Missouri Bureau of Geology and Mines in the identification of fossils was carried on. Paleontologic studies were continued on some early Paleozoic fossils, on echinoderm microfauna from the Mississippian formation, on the Kinderhook fauna, on the Warsaw fauna of the Boone limestone from the Joplin district, and on the fauna of the Louisiana limestone of northeastern Missouri. The Geological Survey in cooperation with members of the Missouri Bureau of Geology and Mines discovered outcrops of fossiliferous Upper Cretaceous beds near Ardeola.

Montana.—Reports on the geology of the Rosebud Creek coal field, Rosebud and Custer Counties, and of the Richey-Lambert coal field, Richland and Dawson Counties, have been approved for publication. A party extended the detailed mapping of the coal beds of a portion of Custer County begun in 1932. A report

for survey publication on the Mizpah coal field of Custer County was almost completed. A reconnaissance areal and structural geologic survey was made of parts of Hill, Chouteau, and Liberty Counties.

The report on the lignite fields of McCone County was advanced, and the report on the geology of the Little Rocky Mountains and the surrounding plains was completed. Studies of the glacial geology and physiography of western Montana, northern Idaho, and eastern Washington were continued in connection with a comprehensive report on the subject. Field and office studies of the gold placers of the Pioneer district were continued, including the examination of phosphate lands near Marysville. Areal mapping and study of mines in the Libby and Troy districts of northwestern Montana were continued and considerable progress was made on detailed reports on the districts. Travertine deposits were examined near Gardner, the report on which will appear as a circular under the title "Some Deposits of Ornamental Stone in Montana." An examination and report on the Mission Creek dam site, Lake County, was made for the Office of Indian Affairs. A geologic map of the State is being compiled in cooperation with the Montana Bureau of Mines and Geology. A correlation chart in two sheets was issued. Work on Fort Union fossil plants is noted under North Dakota, and on source sediments of petroleum under "General studies."

Nebraska.—A reconnaissance of certain Pleistocene deposits in Nebraska was made in connection with a cooperative study of ground-water supplies by the water-resources branch and the State conservation and survey division.

Nevada.—In cooperation with the Nevada Bureau of Mines investigations of some mining districts in the State were continued. Field work was conducted in a resurvey of the Eureka district begun last year and examinations were made in the Tuscarora district and in the Mountain City district in Elko County. The geysers near Beowawe were also studied. A report on the Mountain City district was transmitted to the State bureau. Work was continued on the geology and ore deposits of the Tonopah and Tuscarora areas. Field work in the Chief and Delamar mining districts near Caliente was carried on including the collection of specimens for the purpose of determining the extent of magnesite at the brucite deposits. Examinations were made, in cooperation with the Nevada Bureau of Mines, of the effects of Cedar Mountain earthquake of December 1932 and its bearing on the genesis of Basin Range structure.

The report on the Tybo area for publication by the Nevada Bureau of Mines was completed. Progress was made on the detailed reports on the geology and ore deposits of the Ivanpah quadrangle, California and Nevada, and on the geology of the Great Basin. Several investigations were made for the Office of Indian Affairs including an examination and report on the Rio Vista and Weber Dam sites, in the Walker Indian Reservation, a preliminary examination of two dam sites in the western Shoshone Indian Reservation, and a final examination and report on these sites. A special examination of mining claims in the Duck Valley project was also conducted.

New Jersey.—Several localities in New Jersey for the purpose of collecting Cretaceous and Tertiary Foraminifera were visited.

New Mexico.—The report on the geology and mineral resources of the Santa Rita district was completed and submitted for publication as a survey bulletin. Work was continued on the report of the geology and ore deposits of the Magdalena district. The Geological Survey continued its studies of the Central mining district, Grant County, in cooperation with the New Mexico Bureau of Mines and Mineral Resources. The report on the Mount Taylor coal field, which will form part of a bulletin on the geology and fuel resources of the southern San Juan Basin, was completed, and a report on the coal fields of that part of the San Juan area extending from the Nacimiento Mountains westward including portions of

McKinley, Sandoval, and San Juan Counties, is nearing completion. A map showing the geologic structure of an area in the basin covering parts of McKinley, San Juan, Sandoval, Bernalillo, and Valencia Counties, was issued during the year. Preparation of the report on the Mount Taylor volcanic field, which comprises a study of the structural geology, was continued. Further field studies in the San Juan Basin region begun early in the summer of 1933 and consisting of detailed mapping for the purpose of determining the coal resources and oil possibilities of an area along the east flank of the basin from Cuba north to the State line were prosecuted.

The work on the Abo fauna of the Sacramento Mountains was continued during the year. Studies of the Permian of eastern New Mexico are included under Texas.

New York.—Work in the Taconic quadrangle is noted under Massachusetts.

North Carolina.—The diatoms, mollusks, and foraminifers from test water wells in and near Elizabeth City are being studied, the results to be published in an unofficial medium.

North Dakota.—Work was continued in the preparation of a report on fossil plants from the Fort Union and associated formations, based on collections from North Dakota, Montana, and Wyoming.

Oklahoma.—Revision of the report on the geology and economic resources of the McAlester coal field was completed during the year and work was also continued on a report on the Howe-Wilburton field. A preliminary map showing the coal beds and mines of the McAlester district was issued. Studies of the fossil flora of the coal fields of eastern Oklahoma were continued. A paper on the Moorefield fauna is in the course of preparation. Desirable drilling sites for gas wells in an area in Osage County, for the Office of Indian Affairs were reported upon by the Survey.

Oregon.—Several reports were in course of preparation or publication during the year as a result of studies previously carried on in cooperation with the Oregon State Mining Board. The report on the Robertson, Humdinger, and other mines of southwestern Oregon was issued as Bulletin 830-B. The report on the Takilma-Waldo and Blue Creek districts is in press as Bulletin 846-B, and the report on copper deposits in the Squaw Creek and Silver Peak districts and at the Almeda mine, southwestern Oregon, with notes on the Pennell & Farmer and Banfield prospects, will appear as circular 2. A report on some mining districts of eastern Oregon with a chapter on the Ochoco district is in press as Bulletin 846-A, and a bulletin on quicksilver deposits of southwestern Oregon has been submitted for publication. A report is also nearly finished on the geology of the Baker quadrangle including a short paper on greenstones of eastern Oregon. The report on metalliferous mineral deposits of the Cascade Range in Oregon was completed for official publication. Studies of diatoms of eastern Oregon were continued.

Pennsylvania.—Work on cooperative projects with the Pennsylvania Topographic and Geologic Survey included preparation of a report on the geology of the York and Hanover quadrangles, and field work in a study of the structure of the Reading and Boyertown Hills, for a detailed report in preparation on the geology of the Reading and Boyertown quadrangles. Progress was made on the reports on the geology and mineral resources of the Butler and Zelienople quadrangles and the geology and mineral resources of the Tyrone quadrangle. Studies on the effect of progressive metamorphism in the Lower Kittanning coal beds of Pennsylvania were continued.

South Carolina.—Manuscript of report on the geology of the Coastal Plain of South Carolina was completed.

South Dakota.—A paper on a lower Lance florule from Harding County was completed for survey publication.

Tennessee.—In connection with the studies of the Appalachian lead and zinc deposits, visits were made to some zinc mines at Mascot and Jefferson City. A map showing the mineral resources of the Tennessee River Basin has been compiled and is in press.

Texas.—The compilation of the cooperative geologic map of Texas progressed during the year. A monograph on the Midway fauna of Texas was completed and transmitted to the Texas Bureau of Economic Geology for publication. Stratigraphic studies in the Tertiary near Laredo were also continued in cooperation with the water-resources branch. Further studies of the geology of the Diablo Plateau region, southwestern Texas, are in progress. Work on source sediments of petroleum is noted under "General studies" (Trask), on the genus *Diploschiza* under Alabama, and on the Southern Pacific guidebook under Arizona.

Utah.—Reports on the geology of the Salt Valley anticline and the northwestern flank of the Uncompahgre Plateau, Grand County; on the Monument Valley-Navajo region of San Juan County; on the geomorphology of the north flank of the Uinta Mountains; and on the Gold Hill quadrangle were completed for survey publication. A preliminary map showing the geologic structure of parts of Emery, Wayne, and Garfield Counties was issued.

Work was continued in preparation of the report on the Green River Desert and the eastern flank of the San Rafael Swell and the field work necessary for the preparation of a preliminary geologic structure contour map of southeastern Utah was completed. Additional field mapping of the geology of a portion of the Wasatch Plateau, with special reference to the coals, was done. Field work was conducted for a short time in connection with studies on correlation of the geologic formations of the Colorado Plateau region of southern Utah. A correlation chart in two sheets was issued. Work on the Paradox formation is noted in other sections of the report.

Vermont.—Studies were continued on the geologic structure of the State. Field work was conducted and study made of certain problems in metamorphic geology in east-central Vermont. Work in the Taconic quadrangle is noted under Massachusetts.

Virginia.—In cooperation with the State Geological Survey further field and office studies were made for a report on the geology of the Appalachian Valley in Virginia to be published by the State. Detailed mapping of the Abingdon quadrangle was continued and a brief field examination in southwestern Virginia was made in connection with investigations of the lead and zinc deposits, the report on which has been transmitted to the State. Preparation was continued of a paper on the titanium deposits of Nelson and Amherst Counties.

Washington.—A chapter on copper in Washington was written for the volume on copper by the International Geological Congress. Investigations of the glacial geology and geomorphology of eastern Washington are noted under Montana.

Wisconsin.—Work in the Lake Superior iron-ore region is noted under Michigan.

Wyoming.—Field and office work were continued on the geology of the Afton quadrangle with special reference to the occurrence of phosphate. The work of preparing the report on the Tertiary rocks of the Green River Basin was also continued. In the summer of 1933 a field study was started of the oil-shale deposits of the Fossil and Washakie Basins of southwestern Wyoming. Studies of the Tempskyas of the Wyan and Aspen deposits of southwestern Wyoming and southeastern Idaho were prosecuted during the year.

WORK IN CHEMISTRY AND PHYSICS

The work in chemistry and physics includes the chemical analysis of rocks, ores, and minerals collected by geologists, tests necessary to identify specimens received by the Survey, descriptive mineralogy, including studies of the physical and chemical properties of minerals and ores, their genesis and geochemical relationships, and measurements of deep earth temperature. Among the materials analyzed in the laboratory during the year were 15 igneous rocks from mining districts in Colorado and Nevada, 2 tallow clays from Arkansas, 7 siderites from Idaho, and about 30 dolomites, 14 clays, 29 phosphates, and 40 separate minerals, including potash minerals, from different localities throughout the country.

During the year 5,464 examinations were made by the section of chemistry and physics, of which 1,722 were identifications of potash and related minerals by the petrographic microscope. The potash work also required 437 qualitative tests and 286 quantitative analyses, making in all 2,445 tests for potash. Identifications of specimens submitted by persons not officially connected with the Survey numbered 1,051. The remaining 1,489 qualitative tests and 479 quantitative analyses were made chiefly in response to direct requests by geologists and partly in connection with chemical and physical studies involving methods of analysis and geochemical investigations.

ALASKAN BRANCH

The Geological Survey's work in Alaska has two rather distinct phases—one of a general investigational and research type and the other of a semiadministrative type in connection with the technical supervision of the leases granted by the Government covering coal, oil, or other mineral lands.

Manuscripts and publications.—During the year 5 reports and 1 map have been published and the following maps were issued in preliminary photolithographic editions:

Wrangell district ($55^{\circ}26' - 56^{\circ}31'$; $131^{\circ}45' - 133^{\circ}15'$).

Tonsina district ($61^{\circ}2' - 62^{\circ}$; $144^{\circ}55' - 146^{\circ}25'$).

Anthracite Ridge ($61^{\circ}46'31'' - 61^{\circ}51'1''$; $148^{\circ}3'52'' - 148^{\circ}11'21''$).

Kodiak and vicinity ($57^{\circ}21' - 58^{\circ}1'$; $152^{\circ}8' - 153^{\circ}12'$).

In addition, 23 manuscript reports (including maps) and 2 separate manuscript maps have been completed by their authors and are in various stages of proof or preparation for publication. At the end of the year 7 manuscript reports and 4 manuscript maps were partly completed.

Work on mineral resources.—In addition to the routine duties of administration 11 principal projects, 7 of which involved field work, were carried on during the season of 1932. The 7 field projects were reconnaissance topographic mapping in the northern part of the Ketchikan and Wrangell districts, southeastern Alaska; mineral investigations in the Taku district, southeastern Alaska; reconnaissance geologic mapping in the Tonsina district, in the west-central part of the Copper River Valley; reconnaissance topographic mapping in the Slana-

Suslota Pass district, at the head of the Copper River Valley, and at scattered points along the Richardson Highway; reconnaissance topographic mapping in the northern part of Kodiak Island, southwestern Alaska; reconnaissance of portions of southwestern Alaska and the Aleutian Islands, in connection with a Navy Department expedition; general reconnaissance of recent mining developments, particularly in central Alaska and Seward Peninsula.

During the year a little more than 1,000 square miles of new drainage base was compiled from aerial photographs taken by the Navy Department in 1926 and 1929. This covered part of the region north and west of Wrangell, in southeastern Alaska, and was prepared for one of the topographic projects for the season of 1933. Work on the comprehensive report on the large tract of country lying west of the international boundary and between the Yukon and Tanana Rivers, based on the field work done in the past 30 years, was continued.

Owing to the severe curtailment of funds for the fiscal year 1932-33 and the even more drastic curtailments for 1933-34, together with the necessity of suspending new work until various pending matters of policy and procedure were settled, only three field projects were started before the end of the fiscal year, and the personnel of two of these had not reached the field by June 30. One of these projects involved detailed topographic mapping in the Aleutian Islands in connection with investigations by the Navy Department. The other two projects are a continuation of the reconnaissance topographic mapping in the Wrangell and Ketchikan districts of southeastern Alaska, and a geologic reconnaissance of the mining camps in central Alaska, especially in the Ruby, Poorman, Innoko, and Iditarod districts.

At the end of the fiscal year the preparation of a comprehensive summary of all the available information regarding the geology and mineral resources of the Chitina Valley and adjacent parts of the Copper River region had been begun.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 45.6 percent mapped, the year's increment amounting to 0.4 percent. There was a large increase in the area covered by topographic base maps without contours prepared from aerial photographs after field examinations and an increase in the area mapped by stereophotogrammetric methods. The resurveys in large part covered areas previously surveyed on a smaller scale.

New topographic surveys of the United States, July 1, 1932, to June 30, 1933, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—						Total area mapped in fiscal year (square miles)	Resur-vey	New sur-vey	Percentage of total area of State mapped to June 30, 1933	Spirit levels (miles)	Transit traverse (miles)	Triangu-lation sta-tions oc-cupied		
		12,000 or larger	24,000	31,680	48,000	62,500	125,000									
Alabama	25,100					212	200		223	189	41.3	39	—	—	—	
Arizona	5,10,50					711			711	52.1	52.1	440	458	9	—	
Arkansas	5,25,50,100					a 425	4,018		2,834	1,332	22.685	42.5	1,589	180	68	
California	50					b65	29			22	1,090	132,137	83.5	—	—	
Colorado											56,342	54.2	—	—	—	
Connecticut											4,965	100.0	—	—	—	
Delaware											2,370	100.0	—	—	—	
District of Columbia											70	100.0	—	—	—	
Florida											4,718	8.0	—	—	—	
Georgia											24,987	42.1	—	—	—	
Idaho	100										39.0	33.9	416	416	26	
Illinois	5,10,20					73			1,634	190	121	32,684	64.6	269	26	
Indiana										1	467	1,139	36,601	10.1	—	—
Iowa											3,683	10.1	—	—	—	
Kansas											13,167	23.5	—	—	—	
Kentucky											64,159	78.1	—	—	—	
Louisiana	5,10					b3,964			12		26,620	65.6	—	—	—	
Maine	20										12	20,5	—	—	—	
Maryland	10										9,933	62.9	491	1,128	40	
Massachusetts						b20					1,806	20,773	62.9	—	12	
Michigan						b3,118					1,2	12,327	100.0	—	—	
Minnesota	2,10,20	(b 4)									29	8,266	100.0	60	62	
Mississippi												14,069	24.3	379	—	
Missouri	5,10,20											117	8,157	18	1	
Montana	100												9,6	—	—	
Nebraska													6,754	14.4	—	
Nevada													6,754	67.4	677	
New Hampshire													46,793	29.6	618	
New Jersey													43,452	29.6	—	
New Mexico	20,100												27,117	35.0	—	
New York	5,10,20												53,334	48.2	—	
North Carolina	50												9,302	100.0	61	
North Dakota													8,224	100.0	—	
Ohio													42,917	35.0	335	
Oklahoma													49,204	100.0	28	
													19,040	36.3	—	
													13,148	18.6	19	
													41,040	100.0	—	
													4,927	59.8	—	

^a Includes 102 square miles mapped from aerial photographs by means of stereophotogrammetry.^b Lithographic publication only.^c Culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.^d 0.3 square mile mapped on scale of 1:1,200.

New topographic surveys of the United States, July 1, 1932, to June 30, 1933, and total area surveyed in each State—Continued

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—				Total area mapped in fiscal year (square miles)			Percentage of total area of State mapped to June 30, 1933	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000 or larger	24,000	31,680	48,000	62,500	125,000	250,000				
Oregon	100								885	254	36,460	37.7
Pennsylvania	20								389	389	38,228	84.7
Rhode Island											1,248	116
South Carolina											13,737	6
South Dakota											44.3	24
Tennessee	50										19,243	
Texas	20, 50										25,627	
Utah	50										88,493	
Vermont	20										19,822	
Virginia	10, 20 b / 6										209	
Washington	100										295	
West Virginia											170	
Wisconsin	10										8,139	
Wyoming	100										85.1	
Total continental United States (exclusive of Alaska)		6	821	7,773	905	8,762	7,192	2,654	2,908	5,720	11,563	45.6
Hawaii											1,380,772	3,622
											6,435	413

^b Lithographic publication only.^a Includes 32 square miles mapped from aerial photographs by means of stereophotogrammetry.^f Mapped on scale of 1:12,000.

FIELD SURVEYS

Arizona.—The survey of the Camp Verde 30' quadrangle for the Forest Service was completed. The survey of the Quartzite No. 3 15' quadrangle was begun for the Office of Indian Affairs.

Arkansas.—In cooperation with the United States Army district engineer at Vicksburg, Miss., the survey of the Felsenthal, Moro Bay, Ingalls, and Dilolo 15' quadrangles was begun. For the Forest Service the survey of the Mount Judea 15' quadrangle was begun.

California.—In cooperation with the State engineer of California the survey of the Healdsburg 15' quadrangle, the No. 39, No. 40, No. 41, Treadwell, Guijarra Hills, Huron, Corona 1-a, Corona 1-b, Corona 1-c, Corona 1-d, Cucamonga No. 2, Cucamonga No. 3, and Cucamonga No. 4 7½' quadrangles was completed, that of the Tobias Peak 30' quadrangle, the Lakeport 15' quadrangle, and the Cucamonga No. 1 7½' quadrangle was begun, and the revision of the Colfax, Truckee, and Bartle 30' quadrangles was completed. In cooperation with the county surveyor of Los Angeles County the survey of the Mint Canyon, Beartrap Canyon, Fairmont, Hughes Lake, Lake, Neenach, Quail, Palmdale, Manzana, Black Mountain, and Gorman 6' quadrangles was completed and that of the La Crescenta, Sierra Madre, La Verne, and Glendora 6' quadrangles was continued. At the request of the Forest Service the survey of the Hoaglin 30' quadrangle was completed, that of the Yreka 30' quadrangle was continued, and that of the Dixie and South Fork Peak 30' quadrangles was begun.

Colorado.—In cooperation with the Colorado Metal Mining Fund and the Colorado Geological Survey Board, the survey of Independence Pass and vicinity was completed and that of the Como No. 1 and Como No. 2 15' quadrangles was begun. For the Forest Service the survey of the Mount Powell No. 2 15' quadrangle was continued.

Idaho.—The survey of the Trout Creek 30' quadrangle was completed at the request of the Forest Service. In preparation for geologic mapping the survey of the Irwin 30' quadrangle was completed.

Illinois.—The survey of the Pecatonica, Harvard, Marshall, Lomax, Nashville, Keokuk, Jacksonville, Orion, Potomac, Virginia, Prophetstown, and Fort Madison 15' quadrangles and the Collinsville, O'Fallon, Lebanon, and New Athens No. 2 7½' quadrangles was completed, that of the Morrison, Lacon, Petersburg, Mendon, Toledo, Camp Grove, Mount Vernon, Hoopeston, Carthage, and Genoa 15' quadrangles was continued, and that of the Toluca 15' quadrangle was begun. This work was done in cooperation with the Department of Registration and Education of Illinois, Geological Survey.

Louisiana.—The Louisiana Board of State Engineers cooperating, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was completed for topographic base maps without contours for the 7½' quadrangles within the New Orleans, Cut-Off, Houma, Hahnville, Thibodaux, Lac des Allemands, Gibson, Schooner Bayou, Bossier, Shreveport, Plain Dealing, Hosston, Boyce, Abbeville, and Colfax 15' quadrangles and begun for the 7½' quadrangles within the Pecan Island, Redfish Point, Hayes, Bayou Bois Courier, Port Arthur, Sabine Pass, Johnsons Bayou, Hackberry, Lake Arthur, Lake Charles, Orange, Vincent, Marsh Island, Lake Miserie, BBB, CCC, and FFF 15' quadrangles. In cooperation with the United States Army district engineer at Vicksburg, Miss., the survey of the Felsenthal 15' quadrangle was begun.

Maine.—In cooperation with the Public Utilities Commission of Maine, the survey of the Nicatous Lake, Allagash Falls, Umsaskis Lake, Musquacook Lakes, Dover-Foxcroft, Kennebago Lake, Presque Isle, and Guilford 15' quadrangles

was completed and that of the Rangeley 15' quadrangle was begun. In cooperation with the War Department the survey of the Frenchville, Arnold Pond, and Fort Kent 15' quadrangles was completed and that of the Grand Isle and Mars Hill 15' quadrangles was begun.

Massachusetts.—In cooperation with the Massachusetts Department of Public Works, Division of Waterways, the survey of the Sagamore 7½' quadrangle was begun.

Michigan.—In cooperation with the Department of Conservation of Michigan, Geological Survey, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was executed in 7½' quadrangles for topographic base maps without contours for Mackinac County, within the St. Ignace and Bois Blanc 15' quadrangles and the county parts of the Ozark, Rudyard, Pickford, Beavertail Point, and Raber 15' quadrangles; for Lake County, completing the county parts of the Baldwin, Chase, Peacock, Freesoil, and Luther 15' quadrangles; for Mason County, completing the county parts of the Manistree and Freesoil 15' quadrangles; for Delta County, completing the Burnt Bluff, Peninsula Point, Escanaba, Gladstone, Rapid River, and Garden 15' quadrangles and the county parts of the Bark River, Whitney, Rock, Trenary, and Skeels Lake 15' quadrangles; for Marquette County, completing the Helena and Harvey 15' quadrangles and the county parts of the Rock, Skandia, and Whitney 15' quadrangles and beginning the Ishpeming, Michigamme, Eagle Mills, Witbeck, Marquette, and Humboldt 15' quadrangles; and for Wexford County beginning the Mesick 15' quadrangle and the county parts of the Cope-mish, Manton, Tustin, Kingsley, Thompsonville, Fife Lake, Luther, and Peacock 15' quadrangles.

Minnesota.—At the request of the Forest Service the survey of the Ely 15' quadrangle was continued. In cooperation with the Department of Justice the site of a proposed Federal detention farm near Sandstone was surveyed.

Missouri.—The survey of the Piedmont and Iberia 15' quadrangles and the Granite City and Cahokia 7½' quadrangles was completed, that of the Manchester, Sleeper, Long Lane, Upalika, Buffalo, Grove Spring, Thornfield, Niangua, Steelville, Topaz, Gatewood, Edgar Springs, and Big Piney 15' quadrangles was continued, and that of the Springfield No. 1, Springfield No. 4, Tuscumbia No. 1, Tuscumbia No. 4, Versailles No. 4, Sullivan No. 3, Sullivan No. 4, Morrison, Linn, Stone Hill, Berryman, Mokane, Canaan, Richland, Grandin, and Marble Hill 15' quadrangles and the West St. Louis No. 1, West St. Louis No. 2, West St. Louis No. 3, and West St. Louis No. 4 7½' quadrangles was begun, in cooperation with the State geologist of Missouri.

Montana.—The survey of the Trout Creek 30' quadrangle was completed and that of the Thompson 30' quadrangle was begun at the request of the Forest Service. The Bureau of Mines and Geology of Montana cooperating, the compilation from aerial photographs of the culture and drainage was completed for the Nye No. 1, Nye No. 2, Red Lodge No. 1, and Red Lodge No. 2 15' quadrangles.

Nevada.—The survey of the Sonoma Range 1° quadrangle was completed and that of the Morey Peak 1° quadrangle was begun in cooperation with the Bureau of Mines of Nevada.

New Hampshire.—In cooperation with the Highway Department of New Hampshire the survey of the Keene, Monadnock, Newburyport, Winchendon, Warwick, Brattleboro, Berwick, and Newfield 15' quadrangles was completed.

New Mexico.—For the Forest Service the survey of the Talpa 30' quadrangle was continued. At the request of the Office of Indian Affairs the survey of the Shiprock No. 2 15' was continued.

New York.—The survey of the Tarrytown No. 4 $7\frac{1}{2}'$ quadrangle was completed and that of the Catskill and Rhinebeck 15' quadrangles was begun in cooperation with the Department of Public Works of New York. In cooperation with Monroe County and the Department of Public Works of New York the survey of the Spencerport, Brockport, Churchville, Clifton, Webster, Fairport, Hilton, Hamlin, Honeoye Falls, Caledonia No. 1, Caledonia No. 2, and Canandai-gua No. 2 $7\frac{1}{2}'$ quadrangles within Montoe County was completed.

North Carolina.—The survey of the Sassafras Mountain 15' quadrangle was completed and that of the Ranger 15' quadrangle was begun at the request of the Forest Service.

Oregon.—The survey of the Medford 30' quadrangle was completed in cooperation with the State engineer of Oregon. In preparation for geologic mapping the survey of the Dayville 30' quadrangle was completed.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, the survey of the Susquehanna and Genesee 15' quadrangles was completed and that of the Smethport and Coudersport 15' quadrangles was begun.

Tennessee.—The survey of the Sassafras Mountain and Ranger 15' quadrangles was completed at the request of the Forest Service.

Texas.—In preparation for geologic mapping the survey of the Guadalupe Peak No. 2 15' quadrangle was begun.

Utah.—The survey of the Bryce Canyon National Park and an extension of Zion National Park was completed for the National Park Service. In preparation for geologic mapping the survey of the Sevier 15' quadrangle was completed.

Vermont.—In cooperation with the State geologist of Vermont the survey of the Littleton, Keene, and Warwick 15' quadrangles was completed and that of the Guildhall 15' quadrangle was begun.

Virginia.—The survey of the Lexington, Blacksburg, Peterstown, and Pearisburg 15' quadrangles and the Yellow Tavern $7\frac{1}{2}'$ quadrangle was completed and that of the Radford, Pulaski, Waiteville 15' quadrangles and the Gaines Mill, Cold Harbor, and Mechanicsville Battlefields was begun in cooperation with the Conservation and Development Commission of Virginia, Geological Survey.

Washington.—For the Forest Service the survey of the Eatontown 30' quadrangle was continued. In preparation for geologic mapping the survey of the Metaline 30' quadrangle was continued.

Wisconsin.—The survey of the Harvard 15' quadrangle was completed.

Wyoming.—The survey of the Savery Creek 30' quadrangle was continued at the request of the Forest Service.

WATER-RESOURCES BRANCH

Work in the branch is largely conducted in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

States.—The following amounts were expended by States and municipalities from cooperative allotments for surface- and ground-water investigations. In addition, it is estimated that data valued at over \$141,000 were furnished by cooperating officials.

Cooperative funds expended by States and municipalities for work on water resources

State	State expenditures		Municipal expenditures		Total
	Surface water	Ground water	Surface water	Ground water	
Arizona	\$20,977.08				\$20,977.08
Arkansas	1,091.62	\$400.79			1,492.41
California	34,990.02		\$6,050.73	\$13,753.00	54,783.75
Connecticut	7,890.60				7,890.60
Florida	2,980.74	3,522.53	2,638.96		9,142.23
Idaho	22,947.83				22,947.83
Illinois	8,915.53				8,915.53
Indiana	3,999.11		428.31		4,427.42
Iowa	3,191.44				3,191.44
Kansas	7,240.83				7,240.83
Louisiana	887.63				887.63
Maine	6,348.47				6,348.47
Maryland	6,716.34		1,550.76		8,267.10
Massachusetts	4,345.10				4,345.10
Michigan	2,006.61	2,705.72			4,712.33
Minnesota	1,378.20				1,378.20
Mississippi	1,000.00				1,000.00
Missouri	7,462.29		173.40		7,635.69
Montana	9,430.24				9,430.24
Nebraska	14,470.38	3,321.70	248.45		18,040.53
Nevada	1,344.16				1,344.16
New Hampshire	3,277.50				3,277.50
New Jersey	11,471.49	6,564.36			18,035.85
New Mexico	12,919.50	2,057.67			14,977.17
New York	9,019.28	2,502.14	10,501.91	3,000.00	25,023.33
North Carolina	9,857.80	1,437.34			11,295.14
North Dakota	3,739.38				3,739.38
Ohio	15,250.86		2,009.08		17,259.94
Oregon	32,302.10	2,468.01	670.55		35,440.66
Pennsylvania	19,464.85	323.39			19,788.24
South Carolina	3,993.96		317.77		4,311.73
Tennessee	14,961.86	294.39			15,256.25
Texas	27,543.99	23,190.39			50,734.38
Utah	6,017.90		180.18	7,797.24	13,995.32
Vermont	5,625.65				5,625.65
Virginia	18,907.75	1,613.57			20,521.32
Washington	8,491.28		5,268.25		13,759.53
West Virginia	3,500.99				3,500.99
Wisconsin	6,758.95				6,758.95
Wyoming	11,472.52				11,472.52
Hawaii	19,973.06	5,833.05			25,806.11
	414,164.89	56,235.05	30,038.35	24,550.24	524,988.53

The study of surface waters, which consists of the measurement of the flow of rivers, has been conducted in 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and records of stage and other data are collected, from which the daily discharge of the rivers is computed. In the maintenance of the regular gaging stations 40 States, the Territory of Hawaii, and several Government organizations and individuals cooperated. At the end of the year 2,801 gaging stations were being maintained. Records for about 129 additional stations were received, ready for publication, from Government bureaus and private persons.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which the wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering

places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected area were problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for drilling wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year about 50 investigations relating to ground water and reservoir sites were in progress, and work was done in 19 States and the Territory of Hawaii, nearly all of it in cooperation with State or local governmental agencies. In the hydrologic laboratory 496 samples of water-bearing material were analyzed.

The work on the quality of water included the analysis of the mineral content of 1,034 samples of water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as such use is affected by the dissolved mineral matter. The analyses included some for nearly all the studies of ground water in the different States.

The work of the division of power resources comprised the preparation of monthly reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported, an annual report containing revised figures of the monthly production of electricity and consumption of fuel in 1932 previously published in the monthly reports, a report on the developed water power of the United States, and compilations of stocks of coal held by public-utility power plants for inclusion in reports of commercial stocks of coal undertaken quarterly by the Bureau of Mines. The annual report on the capacity of water wheels in water-power plants in the United States was released January 20, 1933, and the final report on the monthly and annual production of electricity for public use in 1932 was released April 27, 1933.

The division of water utilization investigates problems affecting the utilization of the waters of streams and performs administrative work relating to supervision and investigation by the field organization of the water-resources branch and of power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water.

The operation of about 300 gaging stations was conducted by the branch or was performed by permittees and licensees under the

supervision of the branch in connection with 120 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operations under permits and licenses of the Federal Power Commission in connection with 105 projects.

WORK OF THE YEAR BY STATES

Alabama.—The report on Ground Water in the Paleozoic Rocks of Northern Alabama, prepared in previous years by the survey, was published by the Geological Survey of Alabama as Special Report 16.

Arkansas.—The investigation in the Grand Prairie region was continued in cooperation with the Arkansas Geological Survey and the Arkansas Agricultural Experiment Station. Records were obtained of water levels in numerous observation wells, and these records were released to the public in manuscript form.

California.—Water levels were measured in selected wells in southern California. The record now covers a period of 29 years. The investigation of the ground water in the alluvial fan of the Mokelumne River was continued with the financial support of the East Bay Municipal Utility District. A detailed report on the geology of the area and other results obtained in the investigation were released in manuscript form.

Florida.—Investigation of ground-water resources was continued in cooperation with the Florida Geological Survey. Explorations of artesian wells were made in Sarasota County and other areas by use of the deep-well current meter, salinity apparatus, and samplers. An investigation was made of the ground-water conditions in the Lake Okeechobee area.

Hawaii.—The survey of the ground-water resources of the Hawaiian Islands was continued. A comprehensive report on the Island of Oahu was nearly completed, and a concise statement of results was released in manuscript form. Ground-water work was begun on the Island of Maui.

Idaho.—Progress was made on the final reports on ground water in the Mud Lake region and in the Snake River plain.

Kansas.—An investigation and report on a ground-water supply for the Federal prison at Leavenworth was made.

Maryland.—A brief investigation and report was made to the Bureau of Standards in regard to a ground-water supply for that Bureau at Beltsville.

Michigan.—An investigation was conducted in cooperation with the Michigan Department of Conservation in regard to ground-water conditions in Roscommon County, with special reference to protection from forest fires.

Montana.—Progress was made on a report on ground water in Fergus County. Observations were continued on water levels in observation wells at the north end of Flathead Lake.

Nebraska.—The investigation of the ground-water resources of the Platte River Valley was continued in cooperation with the Nebraska Conservation and Survey Division.

New Jersey.—Investigation of ground-water resources was continued through cooperation with the New Jersey Water Policy Commission. A report on Ground-water Supplies in the Camden Region, New Jersey was published as bulletin 39.

New Mexico.—Cooperation was continued with the State engineer in studies of ground-water resources. A comprehensive report on the Roswell artesian basin is in press as Water-Supply Paper 639.

New York.—The investigation of the ground-water resources of Long Island was continued in financial cooperation with the joint legislative committee on water resources and with Nassau and Suffolk Counties.

North Carolina.—Observations were continued on fluctuations of water levels in wells with special reference to their effects upon stream flow, and an investigation of the ground-water resources of Elizabeth City region was made in cooperation with the North Carolina Division of Water Resources and Engineering.

Oregon.—Investigations of ground-water resources were continued in cooperation with the Oregon Agricultural Experiment Station. Progress was made on the final report on the Harney Basin, and work was begun in the Milton-Freewater area.

Pennsylvania.—Cooperation was continued on ground-water investigations with the Pennsylvania Topographic and Geologic Survey. Weekly records were obtained of water levels on about 35 observation wells and were released in manuscript form.

Tennessee.—The project of obtaining records of ground-water levels and pumpage in Memphis was continued in cooperation with the Tennessee Division of Geology.

Texas.—Investigations of ground-water resources were continued in cooperation with the Texas Board of Water Engineers. The Texas Department of Health and the Engineering Experiment Station of the Agricultural and Mechanical College also continued to cooperate. Work was continued in the Houston-Galveston, Winter Garden, San Antonio, and west Texas regions, and an investigation of ground-water problems was undertaken in Jim Wells, Kleburg Brooks, Kennedy, and Hidalgo Counties.

Utah.—The investigation of the ground-water resources of the Jordan Valley with special reference to an increased water supply for Salt Lake City was continued in cooperation with Salt Lake City. An investigation of the Ogden artesian basin was begun in cooperation with the city of Ogden.

Virginia.—The investigation of ground-water resources was continued in cooperation with the Virginia Geological Survey. An investigation of the ground-water resources of the Shenandoah Valley was begun. Water-stage recorders were in operation on four observation wells in Arlington and Fairfax Counties and on the ebbing and flowing spring near Marion.

CONSERVATION BRANCH

SUMMARY OF CASES

The activities in the Washington office with respect to land classification include the preparation of reports in response to requests for data or action on specific cases, the preparation of orders of withdrawal and restoration of lands not involved in specific requests, and the promulgation of broad areal classifications.

The following table summarizes activity with respect to requests for data or action on specific cases. The terms "gain" and "loss" signify, respectively, decrease and increase in the number of cases pending. The number of cases received was less by 2,492 (18.6 percent) and the number acted on was less by 545 (2.7 percent) than during the preceding year. The number of cases pending at the end of the year was decreased by about 52 percent.

Summary of cases involving land classification

Class of cases	Record for fiscal year 1933						Record since receipt of first case	
	Pending July 1, 1932	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1933	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General.....	327	1,203	1,530	1,223	307	+20	2,313	2,313
Time extensions.....							17,216	17,206
Oil development.....	24	130	154	144	10	+14		
Concurrence.....	12	766	773	759	19	-7		
Section 27 cases.....	39		39	39		+39	39	39
Committee cases—Oil and potash.....	147	113	260	257	3	+144	9,418	9,415
Applications for classification as to mineral:								
Oil.....	460	2,619	3,079	3,005	74	+386	23,812	23,733
Miscellaneous.....	4	37	41	34	7	-3	907	900
Applications for mineral permits.....	776	3,240	4,016	3,938	78	+698	57,747	57,669
Applications for mineral leases.....	2	133	135	130	5	-3	1,877	1,872
Applications for patent, potassium.....								124
Federal Power Commission cases:								
Preliminary permits.....	6	54	60	43	17	-11	283	266
Licenses.....								28
Determinations under section 24.....	8	73	81	59	22	-14	425	403
Applications for classification as to power resources.....	21	22	43	33	10	+11	513	503
Applications for agricultural classification.....	74	145	219	182	37	+37	1,352	1,315
Application for rights-of-way.....	15	127	142	104	38	-23	6,876	6,833
Irrigation project reports.....		11	11	9	2	-2		933
Applications under enlarged homestead acts.....	76	118	194	178	16	+60	57,789	57,773
Applications under stock-raising homestead acts.....	1,137	2,144	3,281	2,422	859	+278	139,452	138,593
Applications under ground-water reclamation act.....	1	10	11	9	2	-1	981	979
Indian Office requests for information.....							9,547	9,547
Total.....	3,129	10,945	14,074	12,568	1,506	+1,623		

SUMMARY OF FIELD OPERATIONS BY STATES

Alaska.—Supervised 1 power project. Expended \$7,000 through the Alaskan branch for supervision of 4 leases, 2 licenses, and 18 prospecting permits for coal, and 91 prospecting permits for oil and gas.

Alabama.—Examined 8 tracts in Conecuh, Madison, Morgan, Winston, Tuscaloosa, Marion, and Colbert Counties for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State. Supervised 1 coal lease.

Arizona.—Supervised 11 power projects and prepared for publication maps of 196 miles of river. Examined 34 tracts for agricultural classification and began a cooperative land-classification study for the State. Supervised on public land 1 lease and 3 prospecting permits for sodium, 6 prospecting permits for potash, and 68 prospecting permits for oil and gas.

Arkansas.—Examined 1 tract each in Crawford and Johnson Counties for mineral classification. Supervised 1 prospecting permit for coal and 15 for oil and gas. No production reported.

California.—In cooperation with the geologic branch continued geologic investigation of the north, middle, and south domes of the Kettleman Hills anticline in Kings and Kern Counties. Supervised 31 power projects and prepared for publication maps of 58 miles of river. Examined 19 tracts for agricultural classification and entered into a cooperative agreement with the city of Los Angeles to continue detailed studies of grazing conditions in Mono Lake

and Owens Valley as an aid in administration of lands withdrawn by the act of March 4, 1931 (46 Stat. 1530). Supervised on public land 3 prospecting permits for coal, 9 prospecting permits for sodium, 4 leases and 5 prospecting permits for potash, 222 leases, 5 suspended rights to leases, and 568 prospecting permits for oil and gas. Prospecting for sodium borate deposits was continued during the year. Drilling was done on 4 holes to a total depth of 2,703 feet. Supervised on naval petroleum reserves 24 leases for oil, and gas.

Colorado.—Made stratigraphic, structural, and economic survey of the North and South McCallum anticlines in Jackson County and prepared structure-contour map of the area examined. In cooperation with the geologic branch completed a stratigraphic and structural reconnaissance of the southern part of the Denver Basin. Supervised 11 power projects. Examined 56 tracts for agricultural classification. Supervised on public land 84 leases, 8 licenses, 49 prospecting permits, and 14 awarded lease applications for coal; 1 prospecting permit for potash; and 25 leases, 3 suspended preference rights to leases, and 428 prospecting permits for oil and gas.

Florida.—Examined 1 tract in Walton County for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State.

Idaho.—In cooperation with the geologic branch continued a detailed geologic survey of the Afton quadrangle, Caribou County. Supervised 6 power projects. Examined 69 tracts for agricultural classification. Supervised 11 coal prospecting permits, 2 phosphate leases, and 71 prospecting permits for oil and gas.

Kansas.—Investigated the status of oil and gas prospecting operations affecting certain Federal lands in Scott and Wallace Counties. Supervised 1 prospecting permit for oil and gas.

Louisiana.—Examined 1 tract each in Beauregard and Calcasieu Parishes for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State, with particular reference to operations affecting Federal lands in Caldwell, Caddo, and Grant Parishes. Supervised 10 leases and 1 prospecting permit for oil and gas.

Mississippi.—Examined 1 tract each in Harrison, Holmes, and Lamar Counties for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State, particularly operations affecting certain Federal lands in Amite, George, Jackson, and Wilkinson Counties.

Montana.—Examined parts of 7 townships in Flathead County for coal classification. Completed detailed areal, structural, and economic surveys of the Cedar Creek anticline in Fallon and Carter Counties and of the Sweetgrass Hills in Toole and Liberty Counties. In cooperation with the geologic branch made areal, structural, and economic surveys of 72 townships in Liberty, Hill, and Chouteau Counties for oil and gas classification and of 13 townships in Custer County for coal classification. Supervised 29 power projects and prepared for publication maps of 120 miles of river. Examined 64 tracts for agricultural classification. Supervised on public land 86 leases, 65 licenses, 40 prospecting permits, and 11 awarded lease applications for coal; 1 prospecting permit for potash; 6 phosphate leases and 3 awarded phosphate leases; and 77 leases, 1 suspended preference right to lease, and 551 prospecting permits for oil and gas. The first shipment of phosphate from Government lease land in Montana was made during the year. Supervised on Indian land on 2 reservations 126 leases for oil and gas.

Nebraska.—Supervised 1 prospecting permit for potash and 1 prospecting permit for oil and gas.

Nevada.—Supervised 6 power projects. Examined 26 tracts for agricultural classification and completed regional investigations of agricultural utility pre-

edent to grazing classification in the northeastern part of the State. Supervised 5 prospecting permits for coal, 2 leases, and 6 prospecting permits for sodium, 1 lease for phosphate, 10 prospecting permits for potash, and 51 prospecting permits for oil and gas.

New Mexico.—Examined parts of 8 townships in Taos County and of 2 townships in McKinley County for coal classification. In cooperation with the geologic branch resumed surveys for coal classification in the eastern part of the San Juan Basin in Rio Arriba and Sandoval Counties. Supervised 3 power projects. Examined 37 tracts for agricultural classification. Supervised on public land 21 leases, 36 prospecting permits, and 1 awarded lease application for coal; 10 prospecting permits for sodium; 9 leases and 160 prospecting permits for potash; 68 leases, 24 suspended preference rights to leases, and 1,054 prospecting permits for oil and gas. Supervised on Indian land 1 coal lease, 13 Indian agency coal mines, and 13 leases for oil and gas. Prospecting for potash in New Mexico resulted in drilling of 20 holes to a total depth of 15,706 feet. Two shafts were started for potash, and one was completed. The total depth of shafts sunk during the year was 1,250 feet. A refinery was completed in September 1932 for treating potash salts, and the first shipment of muriate was made September 22.

North Dakota.—Completed a detailed areal, structural, and economic survey of the Cedar Creek anticline in Billings and Bowman Counties. Supervised 69 leases, 20 licenses, 1 prospecting permit, and 4 awarded lease applications for coal, 1 prospecting permit for sodium, and 19 prospecting permits for oil and gas.

Oklahoma.—Investigated oil and gas prospecting operations affecting certain Federal lands in Cimarron, Dewey, Ellis, Harper, Kingfisher, Major, and McClain Counties. Supervised 1 power project. Supervised on public land 17 leases and 13 prospecting permits for oil and gas. Supervised on Indian lands on 21 reservations 65 coal leases, 7 coal prospecting permits, 41 lead and zinc leases, and 5,003 leases for oil and gas. Made 6,588 investigations of oil and gas leases on Indian lands for regulatory, inspectional, and appraisal purposes.

Oregon.—Examined and reported on the geologic features of two dam sites on the Walla Walla River in Umatilla County. Prepared manuscript report on water-power resources of the Walla Walla River and prepared for publication maps of 80 miles of river, investigated power and storage possibilities of the White and Hood Rivers and surveyed 75 miles of river. Made reconnaissance investigation of power possibilities of the Chetco River. Investigated depth to bedrock at three dam sites by geophysical methods. Supervised 4 power projects. Examined 37 tracts for agricultural classification. Supervised 2 leases and 10 prospecting permits for coal, 1 lease for oil shale, 2 prospecting permits for potash, and 24 prospecting permits for oil and gas.

South Dakota.—Completed a detailed areal, structural, and economic survey of the Cedar Creek anticline in Harding County. Examined 1 tract in Perkins County for oil and gas classification. Supervised 4 leases, 2 prospecting permits for coal, and 25 prospecting permits for oil and gas.

Utah.—Made detailed areal and structural survey of the Harley dome, Grand County, and of the part of Petroleum Reserve No. 7 in Washington County, and prepared and published a structure-contour map of the Harley dome. In cooperation with the geologic branch continued areal and structural surveys in Emery and Wayne Counties. Supervised 8 power projects. Examined 68 tracts for agricultural classification. Supervised on public land 41 leases, 2 licenses, and 75 prospecting permits for coal; 43 prospecting permits for potash; 11 leases, 2 suspended preference rights to leases, and 513 prospecting permits for oil and gas. Supervised on Indian land on 1 reservation 3 agency coal mines, and under Navajo Executive order 1 lease for oil and gas.

Washington.—Investigated status of oil and gas drilling operations. Supervised 10 power projects and surveyed 175 miles of river. Investigated storage

and power possibilities on the Queets, Clearwater, Duckabush, Dosewallips, Hamma Hamma, and North Fork of Nooksack Rivers, Wells Creek, and Glacier Creek. Investigated depth to bedrock at two dam sites by geophysical methods. Examined 4 tracts for agricultural classification. Supervised 22 prospecting permits for coal, 1 prospecting permit for sodium, and 5 prospecting permits for oil and gas.

Wyoming.—Examined 1 tract each in Sublette and Teton Counties for phosphate classification and 1 coal area in Johnson County for leasing-law administration. In cooperation with the geologic branch continued a detailed geologic survey of the Afton quadrangle, Lincoln County. Supervised 4 power projects. Examined 163 tracts for agricultural classification. Supervised on public land for coal 41 leases, 22 licenses, 51 prospecting permits, 9 awarded lease applications, 402 leases, 16 suspended preference rights to leases, and 945 prospecting permits for oil and gas. Made 231 analyses of water, 45 of oil, 14 of gas, and 25,750 determinations of oil gravity. Made periodic inspections and pressure test of wells shut in on Naval Petroleum Reserve No. 3 and supervised operations for mudding and plugging certain wells that were in an unsatisfactory condition. Supervised on Indian land on 1 reservation, 41 leases for oil and gas.

MINERAL CLASSIFICATION DIVISION

The work of the mineral classification division includes field determination of the economic geology of lands belonging to the United States and office conversion of the technical data obtained into forms adapted to the needs of public land law administration.

Field investigations made for purposes of mineral classification during the fiscal year 1933 by division personnel or on a cooperative basis by personnel of the geologic branch are included in the preceding summary of field operations by States. Office activities show a decrease of 1,318, or 15 percent, in the number of requests for mineral determination received and an increase of 745, or 9 percent, in the number of such reports rendered. Progress during the year in classifying the vast areas of public land still withdrawn for mineral classification is shown in the following table:

Summary of outstanding mineral withdrawals and classifications, June 30, 1933, in acres

State	Coal		Oil	
	Withdrawn	Classified as coal land	Withdrawn	Classified as oil land
Alaska		56,993		
Arizona	139,415			
Arkansas		61,160		
California	17,603	8,720	1,178,392	
Colorado	4,142,233	3,082,272	215,370	
Idaho	11,520	4,603		
Louisiana				
Montana	6,442,830	19,254,927	466,990	4,233
Nevada	83,673		1,336,697	67,651
New Mexico	5,061,011	579,638		
North Dakota	5,954,364	11,178,286	84,894	
Oregon	4,361	18,887		
South Dakota		250,093		
Utah	3,404,043	1,267,697	1,341,264	
Washington	691,801	141,444		
Wyoming	2,260,604	2,674,594	541,777	
Total	28,213,458	32,645,314	5,165,384	71,884

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).

² Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

*Summary of outstanding mineral withdrawals and classifications, June 30, 1933,
in acres—Continued*

State	Oil shale		Phosphate		Potash
	Withdrawn	Classified as oil-shale land	Withdrawn	Classified as phos- phate land	Withdrawn
California					
Colorado	1,172,778	952,239			90,324
Florida			66,796	120	
Idaho			276,239	270,036	
Montana			279,944	3,833	
Nevada	123				39,422
New Mexico					9,282,160
Utah	2,737,274	2,703,755	277,344	2,937	
Wyoming	2,328,370	406,003	989,149	25,293	
Total	6,238,545	4,061,997	1,889,472	302,219	9,411,906

Action required during the year on original filings under the mineral-leasing laws is indicated in the following table and shows an increase of 3,294, or 425 percent, in the number of reports rendered on such filings.

Applications under the mineral-leasing laws, fiscal year 1933

[Includes cases pending July 1, 1932]

Mineral	Prospecting permits		Leases	
	Received	Acted on	Received	Acted on
Oil and gas	3,650	3,578		
Coal	236	231	123	119
Phosphate			6	6
Sodium	17	17	2	2
Potassium	86	85	4	3
Sulphur	27	27		
	4,016	3,938	135	130

Pursuant to paragraphs 2 and 25 (k) of the Oil and Gas Regulations (47 L.D. 437), definitions of the "known geologic structure" of 22 producing oil and gas fields were prepared and promulgated during the year, as follows:

Definitions of "known geologic structure", fiscal year 1933

State	Field	Date promulgated	Acres
California	Buena Vista Hills (revision)	Feb. 14, 1933	29,123
	Kern River (revision)	Feb. 28, 1933	11,772
	Kern Front	do	4,640
	West Kern Front	do	1,400
	Mount Poso	do	2,800
	Round Mountain	do	3,951
	Dominion	do	680
Colorado	Dorsey	do	360
	Thornberg	July 1, 1932	1,738
Montana	Hiawatha	July 6, 1932	3,691
	West Hiawatha	do	1,757
New Mexico	Piceance Creek	do	11,431
	Cut Bank	Mar. 15, 1933	76,351
Utah	Bloomfield	Dec. 2, 1932	4,520
	Kutz Canyon	do	3,956
Wyoming	Harley	May 29, 1933	1,323
	Hiawatha	July 6, 1932	926
	Garland (revision)	Nov. 2, 1932	6,780
	Byron (revision)	do	3,841
	Badger Basin	Nov. 3, 1932	4,400
	West Mule Creek	Nov. 26, 1932	1,404
	Bison Basin	Dec. 2, 1932	440
	(Salt Creek (revision))	Jan. 12, 1933	26,919

The aggregate area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1933, was 944,951 acres in California, Colorado, Montana, New Mexico, Oklahoma, Utah, and Wyoming.

POWER DIVISION

The work of power classification consists primarily in obtaining and making available for use in the administration of the public-land laws information as to the water-power resources of the public lands. The extent of this task is indicated by the fact that areas aggregating nearly 7,000,000 acres are now included in power reserves whose use will be required for the development of about 15,000,000 continuous horsepower. The field projects undertaken during the year are included in the preceding summary of field operations by States.

River surveys to the aggregate length of 250 miles were made of the White and Hood Rivers, Oreg., and the North and Middle Forks of Nooksack River, Wells Creek, and Glacier Creek, tributary to North Fork of Nooksack River, Queets River, and Clearwater River, Wash. Geologic examinations were made at two dam sites in Oregon. The depth to bedrock was investigated at 2 dam sites in Washington and 3 in Oregon. Five dam sites and three reservoir sites were surveyed in Washington.

Administration of the field supervision of power projects for the Federal Power Commission is carried on in this office. Investigations and reports have been made on 10 projects, construction and operation are supervised on 129 projects, and cost accounting is being supervised on 8 projects.

Pursuant to instructions of the Secretary of the Interior, dated August 24, 1916 (45 L.D. 326), reports were obtained on field inspections of 24 power projects under permit from the Interior Department and permittees under the act of February 15, 1901 (31 Stat. 790), and grantees under the act of March 4, 1911 (36 Stat. 1253), were called upon for detailed reports of the operation or development of their power systems during the calendar year 1932. The total installation of the reporting companies is 3,540,000 horsepower, of which 2,407,000 horsepower is at hydraulic plants and 1,133,000 horsepower at fuel plants. The total energy generated was 7,150,000,000 kilowatt-hours, which was 546,000,000 kilowatt-hours less than in 1931 and was the smallest output since 1925. The energy generated by water power increased 1,214,000,000 kilowatt-hours, or nearly 23 percent; and that generated by fuel decreased 1,760,000,000 kilowatt-hours, or nearly 74 percent. The changes from year to year in the percentages of the total power generated by water and by fuels are due principally to changes in run-off in wet or dry years.

AGRICULTURAL DIVISION

The principal functions of the agricultural division consist of the classification of lands as to irrigability, timber character, grazing value, and capacity for crop production under the enlarged and stock-raising homestead laws and the Nevada ground-water reclamation law; the preparation of reports on irrigation projects that require some form of Federal approval in connection with the administration of public-land laws; the initiation of withdrawals of land for reservoir sites and for public watering places; and the preparation of reports showing the agricultural utility of lands in important public-land regions, including a classification of the grazing lands as to forage types and yields and suggestions as to the proper use thereof to maintain a natural ground cover, prevent waste of the forage growth by overgrazing, and incidentally eliminate avoidable erosion losses, especially in grazing districts on the public domain.

Classifications are based on the results of field examinations by members of the division and on information obtained from other sources. The work is planned with the primary purpose of acting on pending applications for classification under the above-mentioned laws and of providing in advance the basis for appropriate action on new applications. There was a decrease of nearly 34 percent in the number received, and the arrearage was nearly 41 percent less at the end of the year than at the end of the fiscal year 1932. Substantially all of the decrease was in applications under the enlarged and stock-raising homestead laws.

Public Water Reserve No. 107, of April 17, 1926, embraces all vacant, unreserved public land that contains a spring or water hole needed or used for public purposes. This order requires a determination with respect to all entries of public land whether any of the subdivisions involved are affected by it. On the basis of such determination, orders of interpretation are issued from time to time, listing by legal subdivisions of the public-land survey any tracts found to contain a water supply affected by the order. New public-water reserves covering lands along streams and for special public purposes are also made from time to time.

In the field, broad areal studies were completed in northeastern Nevada. Intensive grazing studies were continued in Mono Lake and Owens Valleys, Calif., in connection with the administration of lands withdrawn under the act of March 4, 1931 (46 Stat. 1530). A land-classification report and map was completed for western Colorado, showing irrigated and dry-farming land, together with different range types and a summary of the aggregate forage resources as compared with the livestock population.

During the fiscal year the area designated under the Nevada ground-water reclamation act was increased 14,160 acres, to a total of 1,720,695 acres. Outstanding withdrawals under the act of October 2, 1888 (25 Stat. 527), on the basis of a selection by the Director of the Geological Survey, aggregating 61,397 acres, remained unchanged. Other results of the division's work are tabulated in the summaries of enlarged and stock-raising homestead designations and the general summary of cases.

MINING, AND OIL AND GAS LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions is supervisory (both inspectional and regulatory) with respect to operations on the public domain for the discovery and development of petroleum, natural gas, oil shale, coal, phosphate, sodium, potassium, and sulphur; on certain land grants for gold, silver, and mercury; on naval petroleum reserves for petroleum and natural gas; and for all minerals on tribal and restricted allotted Indian lands subject to lease.

During the fiscal year there were 251 leases, licenses, and prospecting permits issued covering 241,843.14 acres. The number was less by 28 and the area less by 83,387.14 acres than in the preceding year. Cancelations, relinquishments, and expirations numbered 183 for 1933, compared with 180 for 1932.

Leases, licenses, and permits issued, fiscal year 1933

	Number	Acres		Number	Acres
Licenses: Coal.....	32	1,360.25	Permits:		
Leases:			Coal.....	84	48,175.03
Coal.....	35	3,316.13	Potash.....	78	161,724.78
Potash.....	3	8,478.71	Sodium.....	14	15,665.34
Phosphate.....	4	2,482.90		176	225,565.15
Sodium.....	1	640.00	Grand total.....	251	241,843.14
	43	14,917.74			

There were 951 mining leases, licenses, and permits involving 838,025.49 acres of public land that were under supervision at the end of the year, an increase over the previous year of 68 leases, licenses, and permits and of 72,962.95 acres.

Prospect wells numbering 29 and drilled to a total depth of 21,472 feet, were supervised during the year, as compared to 39 wells, with a total depth of 29,931 feet, during the preceding year. The number of operating mines was greater by 69 than in 1932. Production of coal was less by 28,945 tons than in 1932. The number of coal mines increased from 432 to 498, or 15.3 percent. The value of the coal produced was \$6,156,200, a decrease of \$366,104. The condition of the wagon mines has shown continued improvement. More

orderly mining plans have increased the life of mines and reduced the cost of mining.

The value of phosphate mined on public lands was \$5,203.66, a decrease of \$100,602.34 over 1932. Production decreased 31,455.99 tons. In Montana, a 1,300-foot crossecut tunnel, started last year to intersect the phosphate rock on a Government lease, was completed, and the initial shipment of phosphate rock was made.

From the potash leases there were produced and sold sodium salts valued at \$533,324.85 and potash valued at \$1,023,232.05. The production of potash increased 127,596.38 tons. During the year drilling was done on 20 test holes for potash in New Mexico to a total depth of 15,706 feet, and in Utah 1 hole was deepened 1,495 feet. Two mine shafts in New Mexico were started during the year. One was completed at a depth of 1,000 feet and the other sunk to a depth of 250 feet. The capacity of the New Mexico potash mines will be ample to meet the American demand for potassium muriates for many years. The accident rate of the United States Potash Co. was reduced 82 percent.

Active prospecting for sodium borates was conducted in the Kramer district in California by a geophysical survey of about 2 square miles and by 3 test holes completed and 1 partly completed; total depth of tests, 4,703 feet. Prospecting for anhydrous sodium sulphate was continued in the Verde Valley, Ariz.

Twenty-five applications for sulphur prospecting permits in New Mexico involving about 15,308 acres, have been received, but no permits have yet been issued.

MINING OPERATIONS ON INDIAN LANDS

The greater part of the mining on Indian lands is in Oklahoma, where there are zinc and lead mines on restricted Quapaw land; coal mines on segregated Choctaw and Chickasaw coal and asphalt lands and on restricted Indian coal lands; and scattered deposits of volcanic ash, building stone, gravel, lead, zinc, and other minerals of less value on other Indian lands. The Geological Survey functions as an agent for the Indian Service in the engineering phases of supervision over these operations.

OIL AND GAS OPERATIONS ON PUBLIC LAND

Engineering and geologic details were completed and departmental approval obtained for the cooperative or unit plan of development of the Pitchfork oil field, Wyoming, pursuant to the act of March 4, 1931 (46 Stat. 1523), amending the Mineral Leasing Act of February 25, 1920. Detailed consideration was given to a proposed

unit plan of development of the Middle dome, Kettleman Hills oil and gas field, California.

Investigations were made regarding the matter of computing Government royalty oil on the basis of 100-percent volume measurement, and engineering reports were submitted to the department. On the basis of reports made by the Geological Survey, the Department September 10, 1932, modified the minimum price requirements for royalty settlements on crude oil produced in the Oregon Basin field. Studies were made in the matter of computing reduction of royalties on crude oil authorized under section 17 of the Mineral Leasing Act of February 25, 1920 (41 Stat. 437), and of allowances to cover the cost of treating emulsified oils.

Oil and gas leases and permits on the public domain

State	Received during fiscal year 1933				Under supervision of the Geological Survey June 30, 1933				
	Leases		Permits		Leases		Permits		Suspended preference rights to leases
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number
Alaska			8	18, 250. 24			91	184, 602. 63	
Arizona			6	12, 483. 88			68	161, 359. 62	
Arkansas							15	23, 502. 60	
California	6	1, 081. 61	159	117, 739. 05	198	52, 740. 48	568	447, 289. 41	5
Colorado	1	640. 60	82	118, 946. 80	25	18, 953. 37	428	754, 472. 73	3
Idaho			12	20, 807. 06			71	134, 904. 77	
Louisiana					10	770. 82	1	40. 00	
Montana	3	716. 23	159	158, 473. 87	77	15, 995. 17	551	545, 618. 36	1
Nebraska			1	280. 00			1	280. 00	
Nevada			5	12, 671. 27			51	122, 861. 74	
New Mexico	8	5, 204. 75	243	453, 114. 94	68	44, 532. 06	1, 054	2, 230, 767. 14	24
North Dakota			8	2, 201. 29			19	22, 913. 70	
Oklahoma			8	3, 220. 91	17	730. 20	13	4, 902. 91	
Oregon			9	14, 253. 46			24	45, 932. 92	
South Dakota			12	10, 922. 66			25	25, 966. 42	
Utah			48	65, 387. 33	11	3, 740. 74	513	1, 059, 333. 58	2
Washington			5	8, 690. 46			5	8, 690. 46	
Wyoming	5	3, 440. 00	239	386, 116. 63	402	120, 600. 52	945	1, 609, 037. 53	16
Total	23	11, 083. 19	1, 004	1, 403, 559. 85	808	258, 063. 36	4, 443	7, 382, 506. 52	51
								69, 822. 28	

WORK ON PUBLICATIONS

Geological editing and drafting of maps and illustrations.—The geologic map of the United States, scale 1:2,500,000, was read in plate proof and color proof, and the printing was directed by the editor. The map was published during the year.

The final drawing of the geologic map of Colorado was begun and about a quarter of the map was drawn. The compilation of the geologic map of Montana in cooperation with the State Bureau of Mines was well advanced. The Somerset-Windbar (Pa.), Montevallo-Columbiana (Ala.), and Hollidaysburg-Huntingdon (Pa.) folios are in hand, and a little progress on them was made during the year.

The geologic map of the Valley of Virginia, scale 1:250,000, prepared in cooperation with the Virginia Geological Survey, was edited, engraved, and read in color proof, and printing was begun. The map of the Tennessee Basin, showing mineral resources, scale 1:500,000, compiled in the fuel section, was drawn for photoengraving, and color proof was read; the map was approved for printing.

DISTRIBUTION

A total of 331 publications, comprising 82 new books and pamphlets (including 29 guidebooks for the excursions of the International Geological Congress), 99 new or revised topographic and other maps, 1 geologic folio, and 149 reprinted topographic and other maps, were received by the division of distribution during the year. A number of special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 148,553 books and pamphlets, 3,776 geologic folios, and 660,456 topographic and other maps, a grand total of 812,785.

The division distributed 109,511 books and pamphlets, 4,285 geologic folios, and 599,108 maps, a grand total of 712,904, of which 3,187 folios and 477,867 maps were sold. The sum received for publications and deposited in the Treasury was \$29,969.12, including \$29,372.52 for topographic and geologic maps and \$596.60 for geologic folios. In addition, \$1,640.85 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$31,609.97.

DIVISION OF ENGRAVING AND PRINTING

During the fiscal year 90 newly engraved topographic maps were printed, including 2 revised maps, and 8 new maps were photolithographed and printed, making a total of 98 new maps printed and delivered. Corrections were engraved on the plates of 133 maps. Reprint editions of 149 engraved topographic maps and 10 photolithographed State and other maps were printed and delivered. In addition, 44 new topographic maps had been engraved and were in press June 30, and the engraving of 30 other new topographic maps was nearly completed. Of new and reprinted maps, 257 different editions, amounting to 659,429 copies, were delivered. One new geologic folio was printed, its edition amounting to 3,776 copies. The geologic map of the United States (4 sheets), scale 1:2,500,000, was printed, its edition (first printing) amounting to 1,087 copies.

A large amount of work was done for 47 other units of the Government and 11 State governments, including many reprints, and the charges for it amounted to about \$138,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

The output of the photographic laboratory consisted of 14,744 negatives (including 4,483 wet plates for photolithographs, 900 wet plates for photographic prints, 13 paper negatives, 2,683 dry plates, 555 lantern slides, and 6,110 field negatives developed), 27,824 prints (including 2,548 maps and diagrams, 24,628 photographs for illustrations and records, and 648 bromide enlargements), 3,944 zinc plates, 320 intaglio etchings, 19 celluloid prints, and 13,238 prints mounted.

LIBRARY

The outstanding feature of the year in the library was the acquisition, through the friendly intercession of Mr. Walter E. Reid, of the great collection of works on precious stones, gems, and jewels assembled by the late George Frederick Kunz, of New York City, who for many years was associated with the Geological Survey. This acquisition was made possible through the generosity of Mrs. Opal Logan Kunz, of New York City, and Mrs. Hans Zinsser, of Boston, to whom the library was bequeathed by Dr. Kunz. The collection is by far the most comprehensive in the world on this subject. The accessions during the year comprised 11,197 books, pamphlets and periodicals, and 1,091 maps.

Amounts appropriated for, transferred to, and expended by the United States Geological Survey pertaining to the fiscal year ended June 30, 1933.

Amount of appropriation	Funds available		Expenditure			Balance	
	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities		
	Made	To be made					
APPROPRIATIONS							
\$143,750.00	\$7,246.34		\$150,996.34	\$150,938.36		\$57,98	
554,400.00	290,864.50	\$51,224.11	806,488.61	\$82,718.35		73,770.26	
373,750.00	41,342.87	7,613.77	422,706.64	407,397.63	1,731.67	13,577.84	
46,000.00	5,150.91		61,150.91	50,439.22	9,84	50,449.06	
17,250.00	3,000.00		20,250.00	20,175.67	24.71	20,200.38	
9,000.00			9,000.00	9,000.00		9,000.00	
60,000.00	3,046.91		69,046.91	57,437.40	1,675.10	59,634.41	
676,000.00	239,72	74,134.99	985,239.71	950,913.66	6,094.12	90,907.68	
190,000.00	197.42		190,197.42	181,447.26	2,018.47	27,386.73	
138,000.00	11.82		138,011.82	68,776.90	26,005.65	6,731.69	
23,000.00			23,986.62	23,696.95		6,882.65	
126,500.00	158,878.36	12,565.66	207,943.42	289,170.46	936.43	23,696.95	
253,750.00	153,403.11		259,153.11	249,682.17	660.52	230,166.89	
* 2,615,400.00	756,287.55	145,637.93	3,517,225.51	3,278,316.82	46,643.62	8,800.42	
TRANSFERS							
d 15,686.79	527.21		16,214.00	16,145.94	68.06	16,214.00	
d * 173.28			173.28			173.28	
800.00			800.00	561.48		561.48	
400.00			400.00			400.00	
d 157,028.20	400.12		57,428.41	55,941.39	176.72	56,118.11	
d 61.78			61.78	61.78		61.78	
250.00			250.00	246.67		246.67	
2,750.00			2,750.00			2,750.00	
d * 3,978.31			38.24	4,016.55	3,479.60	58.38	
25,650.00	36.79	15.05	25,701.84	21,605.82	2.52	21,608.34	
575.00	8.00		583.00	582.30		582.30	
						.70	

Alaska Railroad appropriated fund (act Feb. 14, 1931).
 Engineering operations in the field (War Department, act Feb. 14, 1931, 1931-1 Dec. 31, 1932).
 Federal Power Commission (act Apr. 22, 1932), 1933.
 Field investigations of public health (Treasury Department, act Apr. 22, 1932), 1933.
 Flood control, Mississippi River and tributaries (War Department act Feb. 14, 1931).
 George Washington Bicentennial Commission (act May 21, 1920).
 Irrigation, Indian reservations (reimbursable; act Apr. 22, 1932), 1932-33.
 Irrigation, San Carlos and Florence-Casa Grande projects, Arizona (reimbursable; act Apr. 22, 1932), 1932-33.
 Maintenance and improvement of existing river and harbor works (War Department, act Feb. 14, 1931).
 Maintenance and improvement of existing river and harbor works (War Department act Apr. 22, 1932).
 Maintenance irrigation system, Wanato project, Washington, act Aug. 1, 1914, special fund (act Apr. 22, 1932).
 * 4,003.50

Operation and conservation of naval petroleum reserves (Navy Department, act Apr. 22, 1932), 1933	45,000.00		45,000.00	44,488.18	44,488.18	511.82
Supervising mining operations on leased Indian lands (act Apr. 22, 1932), 1933	69,000.00	2,706.76	71,766.76	70,459.18	12.40	70,471.67
Waterways Treaty, United States and Great Britain (State Department, act July 1, 1932), 1933	55,700.00	2,286.09	57,986.09	57,474.08	478.68	57,952.76
Grand total	2,892,453.45	1762,312.55	2,145,591.22	3,800,357.22	3,552,686.42	47,440.47
						3,600,126.89
						200,230.33

* In addition to these appropriations, there was an allotment of \$12,424.50 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.

^a Of this balance \$40,000 unexpended due to limitation on printing and binding imposed by sec. 302, part II, of the Legislative Appropriation Act approved June 30, 1932.

^b Included in this total is \$284,400 transferred from the roads and trails appropriation of the National Park Service.

^c Balance unobligated on June 30, 1932, and continued available for expenditure in the fiscal year 1933.

^d Balance as of June 30, 1932, \$842.87 has been returned to the War Department.

^e Of the \$1,016.15 balance as of June 30, 1932, \$1,087 has been returned to the War Department.

^f Of the \$8,115.29 balance as of June 30, 1932, \$1,087 has been returned to the War Department.

^g These balances continue available for expenditure in the fiscal year 1934, subject to the approval of the War Department.

^h Of the \$11,292.24 balance as of June 30, 1932, \$7,313.93 has been returned to the War Department.

ⁱ Included in this amount is \$9,000 transferred from the roads and trails appropriation of the National Park Service.

^j Included in these amounts is \$200,496.12 covering work performed by Geological Survey units for other Geological Survey units; supplies furnished by one branch to another; credits to appropriations on account of impounded salaries which have been released; adjustment vouchers between transferred funds and Geological Survey appropriations; and other adjustments necessarily reported in combining totals but otherwise a duplication.

Classification of expenditures by the United States Geological Survey pertaining to the fiscal year ended June 30, 1933

Object of expenditure	Geological Survey salaries	Topographic surveys	Geologic surveys	Fundamental research	Volcano-logic surveys	Alaskan mineral resources	Gaging streams	Classification of lands	Printing and binding	Preparation of illustrations	Geologic and topographic maps of the United States	Mineral leasing	Total
\$150,133.36	\$676,507.24	\$381,355.21	\$47,993.00	\$18,772.92	\$55,747.94	\$775,571.20	\$154,494.98	\$23,103.10	\$249,775.22	\$317,000.17	\$2,807.99	\$2,807.99	\$2,807.99
Stationery and office supplies	2,995.03	598.82	160.79	19.56	275.28	9,803.26	299.69	161.93	92	4,267.87	571.60	8,052.56	8,052.56
Scientific and educational supplies	384.68	1,428.36	344.36	3.20	13.25	89.31	1,218.42	98.15	.60	19,207.96	548.29	44,233.72	44,233.72
Sundry supplies	5,986.23	344.36	344.36	3.20	7.50	33.29	18,044.20	78.00	..	..	..	..	..
Subsistence and care of animals and storage and care of vehicles	1,781.23	576.75	106.44	104.25	70.50	349.32	77.60	..	..	..	106.31	2,961.71	2,961.71
Telephone service	509.26	106.44	104.25	104.25	4.36	780.18	88.32	..	..	..	2.68	1,802.15	1,802.15
Other communication service	188.09	6.94	30.27	1.15	12.30	13.40	2,580.18	88.90	..	..	..	1,942.18	1,942.18
Travel expenses	7,561.42	773.42	488.47	1,075.87	5,045.37	33.57	231.06	1.15	..	..	..	11,103.69	11,103.69
Attendance at meetings	65,773.42	958.63	958.63	..	..	62.14	13,180.14	391.31	..	..	..	11,822.58	11,822.58
Hire, maintenance, operation, repair of horse-drawn and motor-propelled passenger-carrying vehicles	2,839.74	1,203.42	107.57	139.11	30,409.32	4,501.30	1,916.05	4,501.30	..	..	..	15,154.00	15,154.00
Transportation of things	37,410.93	3,677.42	9.84	66.70	1,104.70	17,011.04	5.33	1,916.05	1,916.05	..	..	227.05	227.05
Printing and binding	3.30	..	..	..	..	..	..	..	..	..	..	6,656.61	6,656.61
Lithographing, engraving, and engrossing	15,016.57	1,523.42	72.67	..	718.16	1,274.09	664.35	..	40.41	22.46	..	9.82	9.82
Stenographic work, typewriting, and duplicating work, etc. (job work)	338.03	43.74	8.87	..	295.41	305.84	113.22	..	..	..	..	..	..
Photographing and making photographs and prints	18,678.44	1,567.61	758.39	17.17	404.15	2,500.10	2,131.19	..	..	..	..	..	..
Heat, light, power, water, and electricity	24.02	32.11	1.56	..	40.16	312.31	..	..	..	..	..	..	..
Repairs and alterations	406.27	96.19	..	..	12.30	3,952.73	84	..	..	..	..	..	..
Special and miscellaneous current expenses	305.41	..	..	..	37.45	85.07	..	..	..	..	..	..	..
Purchase of passenger-carrying vehicles	5.20	..	..	..	..	..	..	..	..	..	..	..	..
Furniture, furnishings, and fixtures	583.86	..	..	..	..	..	..	..	..	..	..	..	..
Educational and scientific equipment	483.64	27.64	..	..	..	..	..	..	..	..	..	..	..
Other materials and equipment	5,081.65	2,845.62	28.35	3.75	258.74	40,213.71	923.92	15.36	3,855.57	519.71	53,746.38	53,746.38	53,746.38
	12,321.44	521.48	..	20.32	107.88	10,441.44	328.77	..	1,075.69	291.87	25,117.89	25,117.89	25,117.89

Structures	236.02			7,751.63			31.50	8,019.15
Miscellaneous transfers and adjustments	805.00	30,246.18	4,547.70	837.64	41.69	9,428.53	48,417.44	3,317.89
Total	150,938.36	878,516.76	409,129.30	50,449.06	20,200.38	84,326.90	1,048,921.23	183,646.37
							94,882.55	23,696.95

In addition to the above amounts, there was expended directly by cooperating agencies \$119,654.28 in connection with cooperative topographic surveys and \$313,037.24 in connection with cooperative stream gaging.

OFFICE OF EDUCATION

(GEORGE F. ZOOK, Commissioner)

Dr. William John Cooper, the eighth Commissioner of Education, terminated his period of service in the Office of Education on July 10, 1933, very soon after the closing of the year for which this annual report is prepared. It is therefore a report of the activities of the office under Dr. Cooper's administration.

EDUCATION DURING THE DEPRESSION

To a very great extent the whole program of study of the office has been modified by the present economic situation in the selection of problems, the program of service, the types of publications issued. It has been the serious intent to give prompt, specific, practical help in today's pressing problems.

While the effects of the depression were reflected in school budgets a year or so after they were felt by the industrial and commercial world, this past year has been a critical one for schools of all types and in all parts of the country. Budget reductions for the year averaged about 7 percent in city school systems and 5½ percent in rural schools, representing a reduction of at least \$112,000,000 in current expenditures at a time when enrollments were still increasing rapidly. Budgets for capital outlay, such as new grounds, buildings, and equipment, were cut more than 40 percent. This means spending approximately \$108,000,000 less this year on school buildings, although there are still more than a quarter of a million children going to school on a part-time basis or being housed in portables. These reductions have been reflected in shorter school terms, the closing of many schools, larger classes, employment of about 14,000 fewer teachers this year than last, elimination of many school departments and services, and reduction in teachers' pay ranging from 5 percent to 50 percent or more. Along with these curtailments there has been evident a widespread spirit of criticism of the schools, their programs, and their officials which has expressed itself in demands for drastic cuts and changes.

To be of service to school officials, legislative committees, and laymen interested in education the Office of Education has carried on a series of investigations and issued publications of various types. They have been of three principal kinds:

1. *Investigations to discover what the situation is, how the schools are affected, and what they are doing.*—Of this type have been the four reports on the current situation in city schools, in rural schools, in colleges and universities, and in schools in foreign countries. These studies made early in the year are now being repeated as a retrospect of this year and a prognosis of next. Others have reported on what schools and colleges are doing for the unemployed, both of a relief and a rehabilitation nature. A series of legislative circulars have reported current legislation both completed and pending in Congress and in the State legislatures. The results of these studies have been issued as Office of Education publications, as news releases, and as periodical articles in order to give them widespread publicity.

2. *Investigations of desirable practices for effecting economies.*—School officials are having to act rapidly; they want information on what others are doing in similar circumstances, on how savings can be made without injuring the fundamental educational possibilities. For this purpose the staff has prepared a series of circulars on economies in school administration. They cover such topics as class and school organization, techniques for teaching large classes, correspondence courses for high schools, the elimination of very small schools, the better utilization of school buildings, the care and upkeep of the school plant, centralized purchasing and distribution of supplies, the use of adequate school accounting systems. In each case the report has consisted of reports on how these recommended economies have actually worked out in the city school systems.

3. *Investigations of school practices which have long-time permanent value and to which school officials and the general public should be looking forward.*—Schools will be slow to reconstruct. It is not their hope to build back to where they were but to build for the changing needs and conditions of the public which they serve. A continuous study of the desirable size of the unit for school administration paralleling similar ones of the desirable size of the civil administration unit is under way, parts of which have already been issued. Another problem requiring continuous study is that of the participation of the State and the Federal Government in the financing of education. How is it done? How does it work? How should it be done? These are questions which required continued investigation.

PUBLIC SCHOOL ADMINISTRATION

For many years authorities on school administration have been advocating a unit of school administration and support larger than the small district employing only a few teachers. A few years ago it became evident that the adequacy of the school administrative units provided throughout the country would not only be questioned further but would also be given a severe test with regard to their

ability to maintain good schools. Interest manifested in the various types of administrative units indicated that a study to supplement the recent one on "Administrative Units" was needed to show how economies may be and are being effected through larger units of administration and support. Such a study has been prepared by the office and is now in press, treating of several types of units larger than the small district common throughout the country.

Another study in the field of administration treats of systems of centralized purchasing and distribution of supplies. In many sections of the country supplies are purchased by each of the small school districts independently of one another. The study contains data showing the economies effected when small districts cooperate in the purchase of supplies.

The practice in certain cities of releasing public-school pupils during the school day to enroll in classes in religious instruction conducted by the churches was the subject of a study designed to answer these questions: How extensive is the practice of releasing public-school pupils for religious instruction? How is the plan administered? No attempt was made to evaluate the effectiveness of the plans.

Since the finances of the schools have been seriously affected within the past year or two, studies were made to show what the effect has been in regard to current expenses, teachers' salaries, capital outlay, length of school term, school building construction, size of classes, and services and activities. Additional studies showing the effect of decreased school support on the school are in progress and will be issued some time this fall.

EDUCATIONAL LEGISLATION

The past year has been particularly prolific of legislation affecting education. The Office of Education, while it has not been able to supply all the information requested, has been for more than a quarter of a century publishing reviews of educational legislation enacted within each biennium. Such a review was made of legislation enacted in 1931 and 1932 and published in Bulletin, 1933, No. 2. The review shows changes affecting State school administrative organization, State school support, local school administration, higher education, etc.

When the State legislatures are in session the office issues a series of circulars concerning legislative proposals and enactments affecting education in the various States. During the year four such circulars were issued, and others will follow to complete the summary of educational legislation enacted in 1933.

A study completed and in press treats of the legal and regulatory provisions affecting secondary education, including junior colleges.

This study deals with State and local administration of secondary education, and includes reviews of high school standards prescribed not only by State laws and by school administrative authorities but also those prescribed by regional accrediting associations.

Other studies completed in the field of school law include an analysis of the principal features of free textbook laws in the various States, with data on textbook adoption laws and textbook costs (Circular No. 60), and a summary and digest of statutory laws and judicial decisions pertaining to the releasing of pupils from public school for religious instruction (Pamphlet No. 39).

STATISTICS OF EDUCATION

One of the major responsibilities of the Office of Education is the collection and interpretation of statistics showing the condition and progress of education throughout the country. The program of collection, tabulation, interpretation, and publication of educational statistics has always been an extensive one and as education grows in numbers of persons concerned, and extent of investment the program of the office for this phase of service continues to grow.

It embraces two major aims and fields of service. The first one is that of reporting accurately and adequately the educational statistics for the Nation. This requires a continuous program of inquiry, tabulation, and reporting. The following table shows the fields of inquiry included in the past year's program and indicates to some extent the details which this collection of statistics must give to satisfy the requirements of adequacy.

TABLE 1.—*Review of statistical work, 1932-33*

Subject of study	Type of study ¹		
	Biennial	Periodic	Special
State school systems: Personnel and finances.....	C-T		
City school systems:			
Personnel and finances.....	C-T		
Per capita costs.....		C-T	
Effect of economic situation.....			C-T
Small school systems.....			T
Rural schools:			
Age-grade table for negro pupils.....			T
Libraries.....			T
Effect of economic situation.....			C-T
Higher education:			
Statistics of universities, colleges and professional schools.....	C-T		
Preliminary statistics 1931-32.....			T
Teachers colleges and normal schools.....			T
Background study of negro college students.....			T
Effect of economic situation.....			C-T
Expenditures in liberal arts colleges.....			T
Exceptional children:			
Residential schools for the blind.....		T	
Residential schools for the deaf.....		T	
Residential schools for delinquents.....		T	
Residential schools for mentally deficient and epileptic.....		T	
Residential and public schools and classes.....		C-T	

¹ C is collected; T is tabulated.

TABLE 1.—*Review of statistical work, 1932-33—Continued*

Subject of study	Type of study		
	Biennial	Periodic	Special
Elementary schools:			
Buildings.....			C-T
Case studies of pupils.....			C-T
Private schools.....			C-T
Part-time and continuation schools.....			C-T
Trade schools.....			C-T
Textbooks:			
Per capita cost of.....			T
Sales.....			C-T
Teaching staff: Physical care of teachers.....			C

These inquiries must be extensive in the completeness of the returns as well as in the coverage of types of education. To that end the statistical staff must be meticulous in securing as complete returns as is possible from as far-flung an educational system as is ours. A field staff of four assistant statisticians helps very greatly in securing complete returns, as is evidenced by the fact that during the past year they made more than 1,650 reports for schools which had not reported by mail.

The second major job is that of helping to improve methods of educational accounting throughout the country so that improvement in educational reporting is continuous. The Office of Education continues to assist in this work through the definitions established in its inquiry forms, through the details of its inquiry forms which indicate the items a good accounting system must include, and by the service rendered to State departments and other educational accounting offices by members of its staff.

NURSERY-KINDERGARTEN-PRIMARY EDUCATION

Reports of school budget cuts have challenged the generally accepted notion that kindergartens are an integral part of the elementary school. To show the status of kindergartens in cities of all sizes, a complete summary has been made of kindergarten enrollments, attendance, and numbers of teachers for the years 1930 and 1932. Effects of kindergarten opportunity upon the placement of children in the kindergarten-primary grades and of kindergarten attendance upon their promotion progress have also been indicated.

An experimental section of a long-term study of the promotion-progress of first grade children has been completed. General grade supervisors in 7 city school systems and 1 private school have cooperated in reporting for approximately 1,200 first-grade pupils, mental and chronological ages, promotions, scores on tests to detect tendencies to reversal in reading and to show reading achievement at the end of the school year. Interrelationships of these factors as related to the progress of first-grade children are being summarized.

ELEMENTARY CURRICULUM

Since interest in curriculum construction and materials continues throughout the country, the office has under way a series of publications designed to be helpful to curriculum committees and school superintendents in developing new courses of study. These publications will cover various phases of the elementary curriculum. One number of the series has been issued, "Safety Education—Helps for Schools in Constructing a Course of Study." During this year one other publication has been completed supplying materials for the development of curriculum material on conservation. Although this bulletin gives particular attention to problems of conservation in Alaska, it contains materials designed for the use of curriculum committees and teachers not only in Alaskan schools but also in the public elementary schools in general.

In addition to this series of elementary curriculum studies a number of service publications have been prepared, designed to give aid in problems of curriculum development. These include circulars listing Government materials in history, civics, and other social studies; an annotated list of recent city and State courses of study available for examination in the Office of Education; a circular detailing language activities for primary grades; and bibliographies on the elementary-school auditorium program and other phases of elementary-school work.

COLLEGIATE AND PROFESSIONAL EDUCATION

The self-criticism of institutions of higher education has increased markedly during recent years. This criticism has been accentuated by the financial depression. The public has begun to join in this to such a degree that now the criticism threatens to become destructive rather than helpful. Certain special studies carried on during the past year by the Office of Education have been designed to shed light on the questions at issue in these criticisms.

The following three are among the most important of these questions:

1. What is the State's responsibility for higher education?

Through its governmental machinery the State, as a political unit, creates its public institutions of higher education and provides for their control and support. Through its corporation laws, the State decides the terms under which private institutions shall be established and conducted. Each State would seem to be accountable, therefore, for the adequacy or inadequacy as well as for the economical administration of its entire program of higher education both public and private.

Three studies were completed during the past year bearing upon this question. One of them described the present status of higher education in 10 selected States as disclosed by the number, types, and location of institutions, the methods of their control, and their curricular offerings. The institutions listed included all public and private universities, colleges, technical institutes, teachers colleges, normal schools, and junior colleges so that a clear picture is obtainable of the State's higher educational facilities. The methods by which the State exercises control over its public institutions, the sources of financial support from the State, and the powers of the State budgetary agencies in determining the funds furnished to the institutions were described. For the private institutions were presented the legal provisions under which they obtained their charters, together with the jurisdiction retained over them by the State after their incorporation, and the particular organizations controlling them, whether religious or nonreligious. The curricular offerings of each institution were shown in tabular form so that it was possible to ascertain the number of institutions offering the same curricula. The 10 States represented were: Colorado, Indiana, Kansas, Michigan, Oklahoma, South Carolina, South Dakota, Texas, Virginia, and Washington.

The second study dealt with the growing tendency to unify the control of all State-supported institutions in a given State under a single board and a single executive officer. The historical development of higher education in the several States shows in general that as diverse types of higher education were needed new institutions were created by the States with little reference to those already in existence. A practice of creating a new governing board for each institution prevailed generally. The final result was that there was a multiplicity of governing boards each devoting itself to the advancement of the interests of its particular institution rather than for a State-wide coordinated and integrated system of higher education. Because of this situation a trend toward unified control developed, and central governing boards for all institutions supplanting individual boards for each institution. This movement for centralized control was described for 13 States where such coordination has been most completely achieved. The States considered were: Florida, Georgia, Idaho, Iowa, Kansas, Mississippi, Montana, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, and West Virginia.

The third study presented statistical data for use in answering in part many questions such as the extent to which higher education is regarded as a function to be supported and controlled by the public; the effectiveness of the appeal of the institutions within a

State to the young people of that State; and the percentages of young people who carry their education to the college level.

Because of a lack of funds available for printing in the Office of Education these three studies were published by the Carnegie Foundation for the Advancement of Teaching, New York City, under the title, "The State and Higher Education."

2. Can institutions of higher education be maintained on smaller budgets without serious loss of efficiency?

With heavy reductions in their annual income due to the financial depression, both publicly and privately supported institutions of higher education have been compelled to adopt radical programs of retrenchment. The problem confronting them has been and still is one of making internal fiscal adjustments with a minimum impairment of the educational efficiency of the institution.

In conjunction with Dr. David S. Hill, staff associate of the Carnegie Foundation for the Advancement of Teaching, a study was made of the most practical methods of economizing in higher education. This study was devoted not only to the general principles to be utilized in reducing expenditures but also to specific means which have been found most serviceable in effecting retrenchments. It contains suggestions and proposals for economies in administration, courses and curricula, instructional practices, research, maintenance and operation of physical plants, and business management. The Carnegie Foundation for the Advancement of Teaching published this study.

Another study (published in the Bulletin of the Association of American Colleges) dealt with the grouping of institutions according to type of control and size of student body. This gave certain basic statistical data bearing upon the question of the relative unit costs of small colleges and large colleges.

A third study (mimeographed) dealt with the 1932-33 salaries of college faculty members in institutions classified according to types. Distribution of salaries by ranks and the percentage of decreases from the previous year were tabulated. These two bodies of data make it possible for any institution to compare its salary schedule and its salary decreases with those of comparable institutions.

A fourth study (published in the Educational Record) dealt with certain specific effects which the depression was having upon the colleges and universities during the passing months. A limited number of institutions were addressed, the main data having been assembled from the current literature. Reductions in appropriations, in student fees, and in income from endowments were reported, as were instances of unfavorable legislation.

A fifth study (rotoprinted) dealt with the effects of the economic depression on the fiscal affairs of the institutions of higher education

for the year 1932-33 as compared with 1931-32. Data were collected in this study showing the percentages of decrease in tuition fees, receipts from public sources, educational and total expenditures, and salaries for the various ranks of faculty members.

3. *Are colleges and universities tending to expand their offerings unduly?*

Recent decades have witnessed great expansion of programs in many colleges and universities. No adequate distinction has been made among the objectives and standards which should prevail at the different levels. This expansion is having the most marked effect at present in the graduate field. Many universities are adding curricula leading to advanced degrees. The cost of equipment and staff necessary to carry these advanced courses and research is very great. Two studies have been undertaken to shed light on this question. One on the subject of objectives of graduate education has been done in cooperation with Dean Thompson, of Howard University, and the other, nearing completion, deals with general standards and practices now prevailing in graduate schools.

Two other special studies have been made: Because of the growing interest in student personnel activities, a study was made of the functions performed by deans of men; one additional leaflet (home economics) was completed for the series of guidance leaflets.

EDUCATION OF SPECIAL GROUPS

Recent developments, world-wide as well as domestic, concerned with the education of *native and minority groups* have disclosed more fully the significance of old problems as well as revealed new ones—new at least in the sense that they have not heretofore been generally recognized and understood. A comprehensive, selected bibliography on the education of native and minority groups has been prepared with special reference to the education of groups under the jurisdiction of the United States. It would, however, be incomplete did it not include also, as it does, references on educational undertakings in progress in territories governed by foreign countries whose experience has extended over a longer period of years than ours, as well as those which help the student to acquire a general background of information and understanding of racial traits, abilities, environmental influences, and the like, which underlie successful theory and practice in education.

Another study, completed after a period of 2 years' inquiry, of the intelligence, social traits, and environmental resources and influences of the natives of Alaska has been made available during the year. It was planned to offer a scientific basis for reorganization of the schools for the natives of Alaska, particularly those phases of education which are concerned with curricular adaptation.

A manuscript completed this year and now being printed deals with the education of bilingual children and is a result of more than a year's study of the education of Spanish-speaking children in our Southwestern States. Such children attend our public schools in large numbers, where because of language difficulties, foreign customs, and tendency to live in isolated communities, numerous and often serious problems arise concerned with their attendance and satisfactory progress. This study shows conditions, summarizes progress in research and experimentation pertinent to the problems involved, and gives practical suggestions for improving teaching materials and practices.

A study of the present status of the education of migratory children has been made, chiefly for the purpose of keeping in touch with recent developments and maintaining our informational service. It supplements studies reported in the White House conference publications.

A study of general conditions and educational facilities in the Southern Appalachian Mountain regions, extending over a period of about 2 years and made in cooperation with the Department of Agriculture, has opened up problems for continued study. This pioneer effort to consider underlying relationships of social and economic conditions and popular attitudes to the provision and utilization of schools should be of value in guiding future procedures in other backward regions as well as the one directly under investigation.

EDUCATION OF EXCEPTIONAL CHILDREN

The aim of the Office of Education is to build up a comprehensive well-balanced program providing service for all types of exceptional children and for all phases of the problems involved in their education.

All studies and publications have been directed toward the realization of practical service to administrators, teachers, and parents. State administration is represented by a study of organization for exceptional children within State departments of education. A manuscript giving its findings is now in press. City administrative practices are involved in the published study of Adjustment of Behavior Problems of School Children, which describes and evaluates the clinical program set up within a given city school system. This investigation represents a cooperative project of the Office of Education and city school administrators. A second project of cooperative type is now under way in association with another city.

Teachers' problems with exceptional children have received consideration from two points of view. First, a series of pamphlets is in preparation dealing with practical classroom problems met by teachers in rural and small urban districts where little special help is available. Two of these are in press, one dealing with blind and partially seeing, the other with gifted children. The series is planned

to include a pamphlet for each of the remaining six major groups of exceptional children. The second study for teachers describes group activities for mentally retarded pupils. It is a compilation of activity units and projects contributed by successful special classroom teachers throughout the country. A similar compilation of instructional activities for gifted pupils is planned for the coming year.

Fundamental to a sound policy of service is a knowledge of conditions as they are. Statistics of special schools and classes are therefore indispensable in the scheme of work. During the past year statistical surveys have been made of four types of residential schools: For the blind, the deaf, the mentally deficient, and the delinquent. The results appeared in mimeographed circulars and will be summarized in the printed biennial survey of education for the period 1930-32. An extensive statistical study was also made of day schools and classes for exceptional children in city school systems, the results of which will appear in the biennial survey.

EDUCATION OF NEGROES

Service to the education of Negroes has centered during the year in the completion of two large projects carried on as part of the National Surveys of Secondary Education and of Teacher Education made by the Office of Education. Special studies of secondary education among Negroes and of the education of Negro teachers were made as integral parts of the respective surveys. Each is being issued as a separate monograph of the respective series. Two other comprehensive studies were undertaken during the year, one on education of Negro children in schools under the Jeanes supervisors in certain representative rural districts of the South; the other a background study of Negro college students. All four of these were completed during the year and are now in press.

Another study under way investigates the availability and accessibility of schools and the quality of education furnished to Negro children in rural communities. This is an intensive study of educational conditions in representative counties in six States, selected as reasonably typical of social and economic situations among Negroes in the South. The State supervisors of Negro schools and the county superintendents in the respective States cooperated with the office in the collection of the necessary information. This study, while undertaken in part as the result of experience and of demands made on the office for information concerning the problems under consideration, was inspired in part also by the findings of the four studies mentioned above.

The findings of these studies in the elementary school field add evidence to the lack of availability of schools to Negroes; inadequacy in the quantity and quality of education offered in terms of curricula,

equipment, term length, modern methods and procedures; inadequacy of the training of teachers; disparities between educational opportunities for children in rural as compared with those in other localities; disproportion between the salaries of Negro and white teachers; lack of relationship between the teacher-education programs of Negro colleges and the practical needs of the schools.

SCHOOL HYGIENE, PHYSICAL EDUCATION AND RECREATION

Those responsible for conditions which may influence the safety and health of the child are interested in learning the shortcomings of their own school. To this end the office has prepared a self-survey form, consisting of a series of questions covering the matters of fire prevention and escape, general housekeeping, air conditioning, lighting, seating, water supply, toilets, playgrounds, lunches, mental conditions, instruction in hygiene, bodily conditions of the child, personnel and health of the teacher. If the questions can be answered in the affirmative the school is, according to our present knowledge in this field, doing what it should. Requests for this survey form have necessitated repeated editions.

While health education has been loudly proclaimed as the most important obligation of our schools, health instruction in grades IX to XII has been very much neglected. This fact is pointed out in a publication which also attempts to furnish assistance to those desiring to meet the health educational needs of the students in these important years of their public schooling (pamphlet no. 43).

In 1926 this office made a thoroughgoing study of the health of the teacher, and what was being done about it. This year we have supplemented this work by an investigation of what schools in cities of 5,000 population and over are now doing to preserve and promote the welfare of teachers and other employees by way of health examinations, the granting of sick leave and sabbatical leave, etc.

GUIDANCE AND INDUSTRIAL EDUCATION

For the purpose of aiding in the development of school programs having for their aim the educational and vocational guidance of youth and the training of the individual for occupational employment, the office conducts investigations and renders informational and advisory services in the fields of guidance and industrial education.

During the past year a study was completed and issued as a publication of this office, describing in detail the various State programs. The study, made in cooperation with the National Committee on State Guidance Programs, a standing committee of the National Vocational Guidance Association, includes information relative to the administrative organization of guidance in State departments of edu-

cation and the guidance services rendered by them to the public schools of their respective States in organizing guidance programs.

A mimeographed report of the States' progress in guidance work during the past year was prepared for distribution at the meeting of the National Vocational Guidance Association and a summary published in the Industrial Education magazine.

Continuation schools, which are primarily part-time schools for pupils who early leave school to go to work, are at the present time affected by unemployment conditions. In some places there has been a decrease in enrollments, in other places there has been a modification of the program to include other types of classes. In order to obtain information as to the work carried on by these types of schools, a study was made of 206 part-time and continuation schools throughout the country. Information was compiled on enrollments, teachers, types of classes, subjects of instruction, and the report printed for distribution.

Renewed interest in technical schools and classes has been manifested during the past few years. At the present time questions growing out of the unemployment situation are being raised relative to provisions for training in both technical and trade subjects. To meet requests for information in these phases of education, a study was made of 160 technical and trade schools relative to subjects of instruction included day and evening classes, length of term, library facilities, etc. The manuscript for this study is in press.

EDUCATIONAL MEASUREMENT

A good barometer of the state of the scientific attitude in the school system is the extent to which tests and measurements are used. To encourage the more accurate methods of evaluation and direction of education, certain studies in the test and measurements field have been undertaken during this last year. For example, State departments have need for information at this time regarding the experience of others in carrying on cooperative testing programs. To satisfy this need a survey of the existing cooperative testing programs, both State and national, has been made. The good points of the programs have been summarized and suggestions for their improvement made. The survey is now available as a bulletin of the Office of Education.

A second major problem which has received attention is that of the admission of students to college. The problem of the use of tests in admitting college students is pressing at the present time because of the tendency, just beginning, to disregard the marks and units obtained in high school in considering college entrance. An intensive study of this problem is under way. Other studies of the use of tests for the guidance of college students both on entering and during their

college course are under way in cooperation with authorities in several colleges in order to extend the technique which has been developed. The results of the first of these cooperative studies will be published early this fall.

The third series of problems has to do with the use of tests and test results in the administration of various aspects of the school system. A study of the school life expectancy of failures in the elementary grades has been published in the American School Board Journal. Another of the methods of applying research techniques to radio experimentation has recently been published in the Junior-Senior Clearing House.

SCHOOL BUILDING PROBLEMS

During the past year, the phases of the work in the school building field that have been particularly stressed to have been (1) the techniques of educational planning with relation both to new buildings and existing buildings, (2) methods of utilizing existing plants so as to secure greater capacity, and (3) the importance of long-range school building planning in the present emergency.

The summary of the study on the Functional Planning of Elementary School Buildings has been of particular significance to school superintendents at this time of economic stress because of the suggestions it contains for constructive economies not only in the planning of new buildings but in the use of existing buildings.

Although school building construction decreased approximately 40 percent from 1930 to 1932, there has been a greatly increased school enrollment during the same period. In order that the experience during the World War may not be repeated—that is, too long postponement of school building—followed by a sudden orgy of schoolhouse construction with no scientific study of needs, the Office of Education, in cooperation with the National Advisory Council on School Building Problems, is now undertaking a study, on a national scale and with a long-range view, of present school building needs and estimated school building needs over a 5-year period so that future needs may be met on the basis of scientific, long-range planning.

ADULT AND PARENT EDUCATION

Two major studies have been conducted in this field during the past year. One of these reports in detail the progress of adult education under public auspices in this country. It includes the report of the programs of State departments of education and of city school systems, vocational education for adults under State and Federal auspices, civilian rehabilitation, extension work as carried on by colleges and universities, the work of various opportunity schools, educational

programs for State prisons, illiteracy and its relation to adult education, and the contribution of the public libraries to adult education.

The second study is a continuous one on programs of parent education. The parent education work of the Office of Education was instituted at the request of organizations of parents for service to meet their particular educational needs. Materials and methods for parents' discussion groups have been reported from time to time and accounts given describing the methods and results of various parent education projects. As part of the cumulative study of the methods and practices of the various agencies carrying on the programs and projects in parent education, several sectional reports have been made during the year relating to parent education activities of universities and colleges, of State boards of health, of State departments of education, and of various religious organizations which have continuing programs.

PREPARATION OF TEACHERS AND OTHER STAFF MEMBERS

Within the past few years the major work of the office in this field has been the National Survey on Teacher Preparation. However, several studies other than those prepared by the survey staff have been published. One, a manuscript on the preparation of junior high school teachers, treats not only of the actual scholastic and professional preparation and experience of junior high school teachers, but of the adequacy of their training for the work they are to do, as shown by the number of subjects they are required to teach, the number of classes, the number of distinct preparations, the number and character of the subject combinations taught, and other pertinent topics.

Another publication issued during the year is a status study of the elementary school principalship. Data are presented showing the preparation of elementary school principals in cities of various sizes and in the open country, how much experience they have had, what their salaries are, etc.

COMPARATIVE EDUCATION

Studies of educational affairs of importance in foreign countries have a double value other than their news value. They depict growth toward the fairly common objectives in education and they offer much of value to educators in this country in the way of suggestions for improvement of our own educational systems and endeavors. The office regularly undertakes studies of important educational movements in other countries, attempting to bring out these two values. During the past year, with the help of the Department of State, an inquiry was made into the effects of the economic depression on education in other countries. The returns from the inquiry and data from other official sources were sifted and organized and will be published as Bulletin, 1933, No. 14.

A second type of study undertaken by the office in this field may be illustrated by the investigation of institutions of higher education in Norway. This summarizes for practical purposes the requirements of institutions in Norway, the credentials issued, and gives an indication of the method by which such credentials may be evaluated in this country for entering students. A similar study of institutions of higher education in Denmark is in progress.

Circulars on the chief education offices in the various countries of the world, and the certificates issued by the Scottish Education Department were revised and brought up to date. An inquiry into the literature on higher education in foreign countries, its history and present status, resulted in a bibliography of material relating to that subject.

VISUAL EDUCATION AND EDUCATION BY RADIO

In recognition of the present and potential uses of radio, talking pictures, and other sight and sound aids in education, the Office of Education (1) maintains an informational service; (2) initiates and cooperates in national and State projects and investigations; and (3) participates in the study of international and governmental problems pertaining to these fields. The widespread and rapid developments in these comparatively new and interesting fields require co-operative endeavor among broadcasters, motion-picture producers, sound-recording producers, and educators in the utilization of these marvels of science for the happiness and well-being of the American people.

Informational service.—The Office of Education collects, evaluates, compiles, and disseminates information about the present uses of radio, motion pictures, and sound recordings in education. During the past year a Government bulletin entitled "The Art of Teaching by Radio", a circular entitled "College Courses in Radio", and several articles and releases, have been issued to assist in the dissemination of the information that has been collected and to stimulate the use of available broadcasts and films.

National and State projects and investigations.—During the past year this office has been cooperating with the American Home Economics Association in a study of home economics broadcast series; with the National Committee on Education by Radio and the United States Department of Agriculture in a survey of the radio activities of land-grant colleges; with the National Advisory Council on Radio in Education in studying the use of radio by voluntary organizations and in stimulating interest in the council's broadcasts; to a lesser extent with the Payne fund in its motion picture appreciation experiment; and with other national, State, and local groups.

THE NATIONAL SURVEYS OF EDUCATION

The National Survey of Secondary Education, begun on July 1, 1929, had completed the first two stages by June 30, 1932, and had progressed well into publication at that time. The year just closing has witnessed accomplishment of the major portion of editorial work and actual printing as well as the beginning of the fourth stage, namely, follow-up. The survey report comprises 28 monographs, 11 of which have been issued as this is written; most of the other monographs either are in various stages of printing or are awaiting their turns at the Government Printing Office.

The follow-up work has been accomplished, in the first place, through circulation of the survey reports to State departments of public instruction, libraries, educational periodicals, and individuals who have special interests in certain specific monographs. In the second place, the survey findings have formed the basis for program presentations before a number of educational organizations operating nationally, regionally, or within States; some of these programs have been made up entirely of presentations on the survey; more frequently one or more discussions based on the survey were included with other program materials. The Office of Education has participated in 12 such conferences during the year.

The national survey of the education of teachers, begun in 1930, is nearing completion. Despite curtailed appropriations, the first volume of the survey, containing an extensive bibliography on the education of teachers, has been published, and the complete report, comprising approximately 1,300 printed pages in six volumes, will be ready for distribution during the year 1933. It will contain the following parts: Teacher supply and demand; student personnel; staff personnel; curricula for the education of teachers in normal schools and teachers colleges, and in colleges and universities; training schools and student teaching; summer sessions; graduate work; educational theories; education of negro teachers; history of teacher education; measurement of teaching ability; library facilities; reading interests of teachers; student welfare; in-service education of teachers; education of rural teachers; comparative practice in teacher education; digests of cooperative studies; and general summary and recommendations.

The office is planning to cooperate in any way possible with educational associations and institutions in making use of the findings of the survey, in extending the studies made, or in further study of the numerous problems discovered during the course of the 3-year investigation of the education of teachers.

*OTHER EDUCATIONAL SERVICE**CONSULTATIVE AND ADVISORY SERVICE*

On the whole a very considerable amount of time is given by the members of the staff to consulting with or in other ways assisting members of the staffs of organizations having common educational interests or problems. This service includes, among others, preparation of study outlines on educational subjects, providing selected bibliographies on special subjects, preparing programs for group meetings, reviewing or revising manuscripts, securing or preparing material for special purposes.

Recently the office has attempted to foster conferences in parent education at different universities and colleges for the purpose of bringing groups of parents there for intensive study of parent-teacher and other organization problems. A member of the staff took part in the 1932 summer school parent-teacher conference at Yale University during July and cooperated actively with the State University of Maryland in organizing and developing the program for the 1933 summer school parent-teacher conference. Materials have been prepared and distributed for this work.

At the request and under the auspices of the State departments of education and the State universities in Georgia and North Carolina, respectively, members of the staff have conducted short courses for county superintendents in the two States named. Continuing, advisory service is rendered by members of the staff to various organizations which they serve as officers or committee members.

COMPARATIVE EDUCATION PROBLEMS

In assisting college and university registrars and committees of admission to evaluate the credentials of foreign students, the office handled 626 requests with 1,642 separate documents in 33 languages for cases numbered serially 3485-G to 4110-F, inclusive. This was a decline of 193 from the 819 cases cared for in the previous fiscal year. In addition 118 cases were, for one reason or another, reviewed. As to countries of origin, 56 came from 15 countries in Latin America; 154 from 18 divisions of the British Commonwealth of Nations; 134 from 9 Germanic language countries; 83 from 6 Slavonic language groups; 23 from 9 Near East and 55 from 5 Far East countries; 90 from 7 European Latin-language nations; 21 from 5 Finno-Ugric language countries; and 10 from 3 of the outlying parts of the United States.

Students of comparative education write regularly to the office for aid, and the number desiring help is increasing annually. Bibliographies, loans of books and letters of direction and explanation were used in connection with studies 329-E to 461-S, inclusive, a total of 133 distinct studies as compared with 102 for the year 1931-32.

LIBRARY SERVICE

Besides serving the research staff of the Office of Education the library to a very large extent provides reference and research service to students of education outside of the office. There were 3,569 visitors using the reading room facilities during the past year while 4,196 volumes were charged for use outside the library. The continued improvement of the facilities for reference work is one of the major responsibilities of the library staff. With the augmented space allowed the library, the service to specialists, both inside and outside the office, has been carried on with marked increase in efficiency during the past year. The card catalog, the current file of college catalogs, and the reference collection have been made more accessible, and check lists of materials are available.

A further constant activity of the library staff is the development of adequate book collections in certain specialized fields bearing upon education. This past year the course of study collection has been amplified, catalogued, and made available in the reading room for very extensive use. Work has been begun on the collection of textbooks, probably more complete than in any other library in the country.

INFORMATION SERVICE

Distribution of published material.—Like many other enterprises, the Office of Education faces two problems, production and distribution.

How did the Office of Education distribute during the last fiscal year the facts which its research produced?

Distribution requires two processes: (1) preparation of the facts for easy transportation and hospitable reception, (2) actual dissemination.

1. Work in preparing facts for distribution

	Number	Pages
Manuscripts read and edited:		
For printing.....	52	6,488
School Life issues.....	10	240
For mimeographing.....	56	1,008
Number of galley pages of proof read.....		7,655
News releases condensing facts for newspapers and magazines.....	42	210
Radio releases for distributing facts by air.....	6	24

¹ Bibliographical entries.

2. Dissemination

	Free	Sales
Number of copies of printed publications.....	155,000	1 234,854
School Life (monthly average, 1,445), annual.....	14,450	² 84,638
Reprints from School Life, extra editions, and index to School Life.....	17,400	
Price lists.....	30,000	
Circulars (mimeographed).....	82,200	
Good reference series (mimeographed).....	4,150	
General informational notices.....	243,895	

Making maximum use of facts.—The aim of the Office of Education is to disperse facts widely. To do this we use as many avenues as possible. For example:

Pamphlet No. 34, School Administrative Units, contains these important points: United States has 127,000 school districts; one school board member to each two teachers.

Following are the avenues used to put this before the people:

1. Three thousand copies of Pamphlet No. 34 were sent free to State libraries, public, college and normal school libraries, State superintendents of education, State supervisors of rural education, ministers of education and foreign exchanges, legations and embassies of the United States, educational periodicals.

2. Two hundred and fifty-five copies have been sold through the Superintendent of Documents.

3. News release April 14, 1933, condensing facts in the pamphlet went to 250 Washington correspondents, 374 newspapers outside of Washington, 400 educational magazines. It was sent out on Associated Press wire to 1,500 newspapers and quoted in Hearst editorial. Also used in Time (400,000 circulation).

4. Condensed article in School Life, 20,000 readers.

5. Reprint made for American Legislators Association; 200 sent to leading State legislators.

6. Reported in columns prepared for The Instructor (140,000 circulation), and Journal of the National Education Association (200,000 circulation).

7. Radio releases, 249 stations.

Organized use of the radio as a medium for distributing Office of Education facts was started during the year. A specimen 5-minute radio release designed to be read at local stations was prepared and sent to all stations, with an offer to supply similar releases regularly. Two hundred and forty-nine stations responded requesting radio releases. Frequently the stations ask local school officials and teachers to present the release before the microphone.

Directories.—With 48 States and 127,000 separate and independent school districts, it is natural that educators, citizens, and business people turn to the central service of the Office of Education for director information. During the past year the following directories were published: Educational Directory in three parts—Part I, Principal State and County School Officers and Other Educational Directories; Part II, Principal City School Officers and Catholic Parochial School Superintendents; Part III, Colleges and Universities (presidents and deans of schools); Supplement to List of Accredited Secondary Schools; Supplement to List of Accredited Higher Institutions; Schools of Commerce and Bureaus of Business Research.

Exhibits.—Exhibits of Office of Education publications and services were prepared for 25 educational association meetings.

Writings and addresses.—One hundred and sixty-nine articles were written for publication in periodicals and year books. During the year members of the staff made a total of 349 addresses before National, State, regional, and local groups. Eighteen radio talks were prepared and given,

Correspondence.—During the past year approximately 145,000 letters have been answered by the office.

APPROPRIATIONS

The following tabular statement gives a birdseye view of the funds available to the Office of Education from 1930 to 1934, a period of 5 years. The statement is arranged so as to differentiate the funds available for the regular and continuing work of the office from the funds provided for the special studies which have now been completed.

TABLE 2.—*Funds available to the Office of Education*

Object	1930	1931	1932	1933	1934
Salaries.....	\$230,960	\$253,880	\$280,000	¹ \$252,714	² \$210,000
General expenses.....	11,000	30,000	25,000	17,600	12,500
Printing.....	47,000	55,000	62,000	34,000	30,000
Total, regular work.....	288,960	338,880	367,000	304,314	252,500
Investigation of land-grant colleges.....	14,365				
Investigation of secondary education.....	50,000	100,000	75,000		
Investigation of teacher training.....		50,000	80,000	50,000	
Investigation of school finance.....			50,000		
Grand total.....	353,325	488,880	572,000	354,314	252,500

¹ The appropriation for salaries was \$250,000, to which were added transfers of \$30,000 from National Park Service and \$2,400 from general expenses, Office of Education, making a total of \$282,400. This amount was reduced by legislative furloughs and leave without pay to \$252,714.

² The appropriation for salaries was \$250,000, but the amount that may be expended has been reduced to \$210,000.

These data show that for 1932 the amount available for the regular work of the office was \$367,000, while for 1934 the amount is reduced to \$252,500, a reduction of 31.2 percent. This includes a reduction in the printing funds of more than 50 percent. The amount available for 1934 is less than the amount that was provided for the year 1925. This drastic reduction has rendered necessary the elimination of members of the staff and a considerable curtailment in the output of printed material so necessary to enable this office to function in an effective manner.

STAFF

At the beginning of the year the regular staff of the office numbered 100; during the year 35 temporary and part-time workers were employed on the national surveys. Because of the reduction in the salary appropriation it was necessary to close out 1 position in

February, 7 positions on April 15, and 1 position on June 30, and to require members of the staff to take a short furlough. Thus the office roll numbered 91 at the end of the year, with no temporary employees after June 30 when the national survey of teacher education closed. This is a small staff, unable to report in detail on educational conditions of such varied complexity as are those of this country, and to render the service needed by States and municipalities in the educational readjustments which are taking place. It will be necessary in the very near future to supplement the regular personnel with the service of experts called in for temporary service on particularly pressing problems.

REPORT ON HOWARD UNIVERSITY

Howard University was inspected in accordance with the law during the months of May and June 1933 by a committee of specialists of the Office of Education, appointed for this duty by the Commissioner of Education.

For the first time the university has felt seriously the effects of the depression. This is shown by a considerable decrease in enrollments. The depression has also checked somewhat the plans of expansion of the university in the enlargement of its teaching staff and in the development of the building program. Notwithstanding these difficulties the 10-year program of development has been followed as closely as the finances of the university would permit.

In order to meet the situation the administration has reduced the teaching and administrative staffs. The relative cost of administration and physical plant maintenance of the university has been considerably lessened during the past year.

Institutional policies.—The board of trustees at the meeting in April 1933 recommended a number of important administrative changes in the interest of economy and efficiency to take effect in the year 1934-35. The more important of these include the establishment of the graduate school to take the place of the present graduate division, and the consolidation of the college of education and the college of applied science with the college of liberal arts. It is also planned to discontinue the theological college, the correspondence courses, and evening courses in theology after this year. The graduate school of theology will be continued.

STUDENT BODY

Enrollment.—The grand total enrollment of the university for 1932-33 was 1,893, of whom 1,094 were men and 799 were women. For the year preceding the enrollment was 2,464, of whom 1,464 were men and 1,000 were women. This indicates a net loss of 571 students, or more than 23 percent. This loss was distributed quite evenly

among the several major divisions of the university, although the college of applied science and the theological schools registered slight gains.

THE TEACHING STAFF

The teaching staff of the university in 1932-33 included a grand total of 263 members of whom 152 were full-time and 111 were part-time teachers. These are the equivalent of a full-time staff of approximately 173 teachers. This shows a decrease of 13 full-time teachers and 5 part-time teachers from the number of teachers employed in 1931-32. These reductions have been found necessary in view of the decrease in enrollments and curtailments of the income of the university.

FINANCIAL STATUS OF THE UNIVERSITY

In 1932-33 the total income of the university was \$1,090,844.79, of which \$661,422.27 was from the Federal Government and \$429,422.52 from private and institutional sources. In 1931-32 the income from the Federal Government was \$1,277,380.50 and from private and institutional sources \$564,070.49, a total of \$1,841,450.99. This indicates a loss of \$750,606.20 in total income for 1932-33 as compared with the year preceding. However, this loss does not affect to so great an extent the income for operation and maintenance of the university for 1932-33, as \$602,380.56 of the 1931-32 income was for building construction, while for 1932-33 only \$29,891.35 was available for that purpose.

In 1932-33 the total operating expenditures were \$1,046,328.47, as against \$1,745,195 in 1931-32, certain amounts received from gifts for land each year being still unexpended.

PHYSICAL PLANT

During the year 1932-33 there was constructed a new reinforced concrete walking tunnel system for the distribution of heat, light, and power. This tunnel is 1 mile in length and consists of 5 by 7 feet and 4 by 4 feet tunnels for the distribution of heat, and a separate and distinct concrete-encased terra cotta system of distribution for the new high tension electric distribution service; also the installation of a new system of piping in the above-mentioned tunnel for the distribution of heat. There was also completed the emergency construction project which consists of new highways and the landscaping of the science quadrangle area.

REPORT ON LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is authorized by Congress to require annual reports in detail from the treasurers of the several land-grant institutions of the disbursements of the annual income received by

them under the Land-Grant Act of 1862 and supplementary acts, and annual reports from the presidents regarding the general operations of the institutions. This duty has been assigned by the Secretary of the Interior to the Office of Education.

Land-grant colleges and universities, generally known as agricultural and mechanical colleges, were established following the passage of the first Morrill Act of 1862. By the terms of this act, each State was entitled to receive an amount of public land (or land scrip) equal to 30,000 acres for each Senator and Representative in Congress to which such State was then entitled for the "endowment, support, and maintenance of at least one college where the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." This land is being gradually sold to create an endowment fund which in 1931-32 totaled \$22,497,000. In addition there remained more than \$6,000,000 worth of unsold land. The income from such fund and lands amounted to \$1,090,407 for that year.

By the second Morrill Act of 1890 and the Nelson amendment of 1907, the Federal Government aids these institutions further; since 1911 each State has received from the United States Treasury in accordance with the Morrill-Nelson Acts \$50,000 annually to be applied to salaries and facilities for instruction in specified subjects. Of the total appropriations in 1931-32 (\$2,550,000) 17.6 percent was spent for instruction in agriculture, 28.6 in engineering and the mechanic arts, 11 percent in English language, 8.1 percent in mathematical science, 26 percent in natural and physical sciences, 7.6 percent in economic sciences, and 1.1 percent in teacher preparation in agriculture and mechanic arts.

Thirty States and three Territories—Alaska, Hawaii, and Puerto Rico—maintain 1 land-grant institution each; Massachusetts maintains 2; and each of 17 Southern States maintains 2, 1 for whites and 1 for negroes. About 185,000 regular students of college grade enroll annually during the academic year in the land-grant colleges, about one out of every six college students in the United States. The latest inventory of the land-grant institutions (1931) revealed that more than \$390,000,000 was invested in the 52 institutions for white students, of which 58 percent was in buildings. In 1930-31 the total receipts of the 69 institutions amounted to more than 165 million dollars, of which there was derived from State sources 50.8 percent, Federal funds 10.7 percent, student fees 11.5 percent, and miscellaneous sources 27 percent.

NEEDS OF THE OFFICE

1. Previous sections of the report have called attention to the fact that the staff has been reduced considerably during the past year in order to keep within the salary appropriation. Further reductions in the staff are necessary during the present year 1934. Together these reductions involve curtailments in our work in elementary-school curriculum, rural-school supervision, education of physically handicapped children, home economics, commercial education, physical education, and statistics. At the same time that these reductions in the staff and in the fields of service provided by the office have been made, educational problems have increased rapidly in number and in complexity.

It is evident that the rather small research staff of the office will soon have to be supplemented. This may be done in two ways: It is possible by appointing a specialist for temporary service—that is, for 1 or more than 1 year—to the Office of Education's staff to secure expert research and service in a field which does not justify the creation of a permanent position. It is possible to secure the best specialists in the field for such temporary appointment due to the special professional opportunities which work in a Federal office provides. In the long run this type of appointment may be considered a decided economy since it avoids the necessity of adding rapidly to the permanent staff.

A second means of supplementing the work of the permanent staff is through conferences of specialists held for the consideration of specific problems and for the purpose of making definite recommendations on educational policies. In conferences of this sort the office can avail itself of the most expert service through the work of persons who could not under any circumstances be added permanently to the staff but who are more than willing to cooperate with the office on the study of problems which are of common interest. Plans for these temporary services should be worked out as soon as possible and provisions made for them through the salary and general expense appropriations.

2. Probably at no time have the problems of State educational officials been greater than they are at the present time. Problems of organization, administration, coordination of the various educational units, educational support, curriculum changes, and many others are demanding study and prompt administrative action. Part of the charge laid upon the office in the Organic Act of 1867 was "to promote the cause of education." It seems probable that in no way could the Federal Office of Education do more to promote the cause of education than to grant the requests for service which come to us from the State officials. Illustrations of those calls are numerous: assistance in re-

vising the accounting system, in holding training courses for county superintendents, in reviewing educational legislation, in surveying higher education facilities, in service to State-wide curriculum committees, and so on. To answer these requests adequately, additional funds should be provided for traveling expenses.

3. It is evident that a research staff is fairly limited in its means of reaching the public which it hopes to influence or the school officials which it hopes to serve. This can only be accomplished through personal contact or through written communications. Additional funds for publishing studies of the office are greatly needed if the results of important and expensive investigations are not to be lost or minimized. The publication fund, now less than half of what it was 2 years ago, is quite inadequate for the printing of the office studies.

FEDERAL BOARD FOR VOCATIONAL EDUCATION, 1933

(Dr. J. C. WRIGHT, Director)

(By Executive order of June 10, 1933, effective on August 10, the functions of the Federal Board for Vocational Education were transferred to the Department of the Interior, and the Board made an advisory board to act without compensation. On October 10, 1933, the Secretary of the Interior assigned the functions of the Board to the Commissioner of Education, the necessary personnel under the Board to be organized as a subdivision of Education under the general supervision of the Commissioner of Education, who was directed to proceed with the necessary reorganization of the Office of Education.)

REPORTS FROM THE STATES

The Board is required by the vocational educational and rehabilitation acts to include in its report to Congress the reports made by State boards on the administration of the acts by each State and the expenditure of the money allotted to each State. In compliance with this requirement data reported by the States have been compiled covering in detail by States, expenditures of Federal, State, and local money under State programs, enrollments in vocational classes of different types—evening, part-time, and all-day classes in the fields of agriculture, trades and industries, and homemaking—and number of disabled persons retrained and returned to self-supporting employment, or rendered other vocational rehabilitation services.

ENROLLMENT IN VOCATIONAL SCHOOLS

Under the State plans for voluntary cooperation of the States with the National Government, local programs have continued during the year in each of the 48 States, and in Hawaii and Puerto Rico, and have expanded in some States even under the extraordinary pressure for retrenchment in every branch of public expenditure.

For the first time in the history of the program, however, the total enrollment under State plans fell off from the total of the preceding year.

This decrease is one inevitable consequence of reduction in Federal, State, and local revenues available for vocational education. In this year as compared with the year preceding some \$3,276,000 less money was invested in these schools. Opportunities offered for vocational training were correspondingly reduced, and funds were not available for promoting vocational education in new areas, however urgent the need might be in such areas for widening the range of vocational training to embrace new occupations.

Decreases are, nevertheless, found principally in enrollments of employed workers in evening courses for vocational training and instruction supplementary to their daily employment, and in enrollments of young workers for part-time instruction. These decreases reflect principally the widespread condition of unemployment in

trades and industries. Obviously workers unemployed cannot take vocational courses "supplementary to their daily employment", since they have no such employment. As regards young workers, it is found that when unemployment increases, some of them who would under normal conditions enroll for vocational training during a part of their regular working day, return to the all-day schools for full-time attendance in vocational or other courses. But many cannot or at least do not do this. They continue for the time being neither at work nor in school of any sort. It may be noted further that during the past year, in New York City and in many other communities adult unemployed workers have enrolled in all-day schools for which no enrollments were reported under State vocational programs.

Enrollments in agricultural and home-economics schools, which have not been so directly affected by the unemployment situation, have continued to increase during 1933.

For the year ended June 30, enrollment in vocational schools and courses of all types conducted by local communities under State plans, totaled 1,149,495 boys and girls and adults of all ages, distributed as shown in table 1.

TABLE 1.—*Enrollment in vocational schools operated under State plans: Year ended June 30, 1933*¹

Type of school	Total	Agricultural	Trade and industrial	Home economics
Total				
All types.....				
Evening.....	1,149,495	265,978	537,512	346,005
381,349	83,372	155,594	142,383	
Part-time.....	299,685	12,558	255,397	31,730
Trade extension.....	82,513	12,558	38,225	31,730
General continuation.....	217,172	-----	217,172	-----
All-day.....	458,461	160,048	126,521	171,892
Day-unit.....	10,000	10,000	-----	-----
In schools federally aided				
All types.....				
Evening.....	1,031,571	264,105	489,900	277,566
342,171	81,689	123,777	136,705	
Part-time.....	299,492	12,558	255,204	31,730
Trade extension.....	82,352	12,558	38,064	31,730
General continuation.....	217,140	-----	217,140	-----
All-day.....	379,908	159,858	110,919	109,131
Day-unit.....	10,000	10,000	-----	-----
In schools not federally aided				
All types.....				
Evening.....	117,924	1,873	47,612	63,439
39,178	1,683	31,817	5,678	
Part-time.....	193	-----	193	-----
Trade extension.....	161	-----	161	-----
General continuation.....	32	-----	32	-----
All-day.....	78,553	190	15,602	62,761
Day-unit.....	-----	-----	-----	-----
Increase or decrease (-): 1933 compared with 1932				
All types.....				
Evening.....	-26,667	8,723	-42,079	6,689
-19,556	-6,030	-3,465	-10,061	
Part-time.....	-66,862	1,766	-61,540	-7,088
-12,531	1,766	-7,200	-7,088	
General continuation.....	-54,331	-----	-54,331	-----
All-day.....	60,941	14,177	22,926	23,838
Day-unit.....	-1,190	-1,190	-----	-----

¹ Provisional figures.

As in other recent years enrollment during 1933 has been made up (1) of employed adult workers in evening classes for training along the lines of their daily employment, (2) of young workers who have dropped out of regular full-time day school and have enrolled in a vocational course for part-time instruction, and (3) of boys and girls taking vocational courses as regular full-time pupils in day schools. Classified by broad fields of vocational training, enrollments for 1933 included 265,978 farm boys and girls and adult farmers enrolled in vocational agriculture courses, 537,512 boys and girls and adult workers in trade and industrial courses, and 346,005 girls and women in home economics courses.

Total enrollments in agricultural, trade and industrial, and home economics courses in each of the 16 years since initiation of the program in 1917 are shown in table 2.

TABLE 2.—*Enrollment in vocational schools operated under State plans, by years: 1918-33*

Year	Total		Agricul-tural courses	Trade and industrial	Home eco-nomics
	Number	Increase			
1933 ¹	1,149,495	-26,667	265,978	537,512	346,005
1932	1,176,162	58,606	257,255	579,591	339,316
1931	1,117,556	53,020	237,200	602,755	227,601
1930	1,064,536	16,560	193,325	633,153	238,058
1929	1,047,976	48,945	171,466	627,397	249,113
1928	999,031	87,495	147,481	619,548	232,002
1927	911,626	26,351	129,032	564,188	218,406
1926	885,275	92,851	111,585	537,738	235,952
1925	792,424	102,369	94,765	490,791	206,868
1924	690,055	153,527	89,640	428,473	171,942
1923	536,528	60,700	71,298	325,889	139,341
1922	475,828	151,581	60,236	296,884	118,708
1921	324,247	59,189	43,352	217,500	63,395
1920	265,058	70,163	31,301	184,819	48,938
1919	194,895	30,772	19,933	135,548	39,414
1918	164,123	-----	15,450	117,934	30,799

¹ Provisional figures.

Diagram I shows enrollments each year by types of schools—evening, part-time, and all-day schools—for all schools operated under State plans.

EXPENDITURE OF FEDERAL, STATE, AND LOCAL MONEY

Total expenditures of Federal, State, and local money under State and Territorial plans for salaries of vocational teachers, salaries of State directors and supervisors of vocational agriculture and home economics, maintenance of vocational teacher training, and for vocational rehabilitation of disabled civilians, during the year ended June 30, 1933, are summarized in table 3. No Federal money is available for plant and equipment of vocational schools, and no expenditures of State or local money for plant and equipment of such schools are included in expenditures reported to the Federal Board and summarized in table 3.

DIAGRAM I.—*Enrollment in all schools operated under State plans, including federally aided and nonfederally aided, by years: 1918-33*

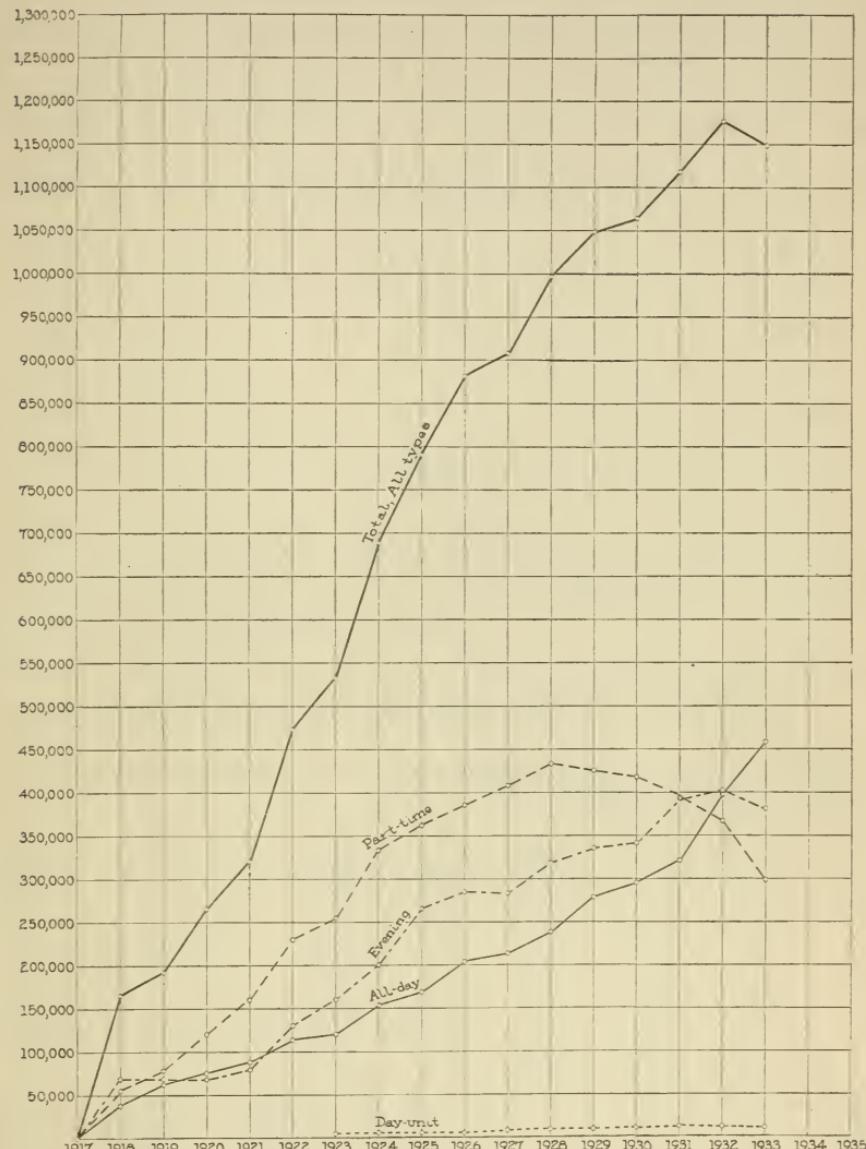


TABLE 3.—*Expenditure under State plans, year ended June 30, 1933* ¹

Field of expenditure	Expenditure			State and local, per dollar of Federal money
	Total	Federal money	State and local money	
Vocational education.....	\$30,126,784	\$7,728,141	\$22,398,643	\$2.90
Vocational rehabilitation.....	2,176,126	1,011,440	1,164,686	1.15

¹ Provisional figures.

That the States and local communities have exerted every effort to maintain their programs of vocational education during the past 4 years of extraordinary pressure for economy will be apparent from the totals of expenditure for these years, as shown in table 4. In 1933 for the first time in the history of the program, expenditures both of Federal and State and local money fell off over the year.

DIAGRAM II.—*Expenditure of Federal, State, and local money for vocational education, by years, 1918–33*

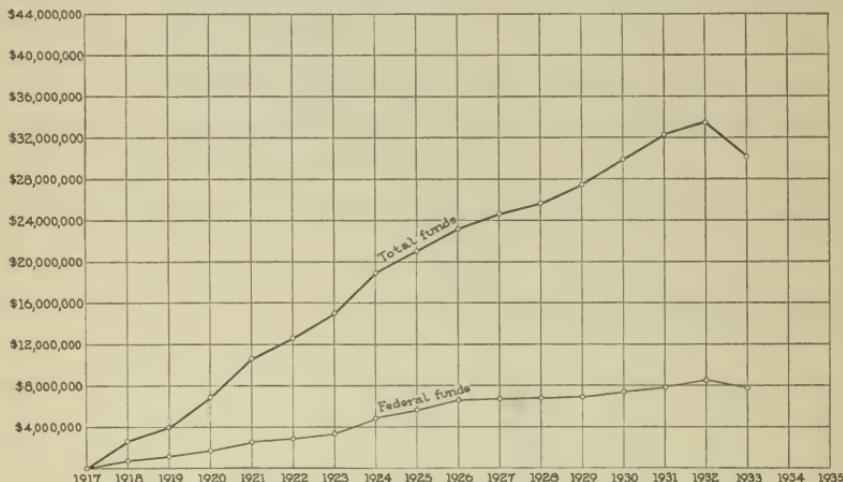


Diagram II shows total expenditure and expenditure from Federal funds each year, 1918–33.

TABLE 4.—*Expenditure of Federal, State, and local money under State plans for vocational education, 1929–33*

Year	Expenditure		Increase or decrease (–) in expenditure	
	From Federal funds	From State and local funds	From Federal funds	From State and local funds
1933 ¹	\$7,728,141	\$22,398,643	-\$686,693	-\$2,588,926
1932	8,414,834	24,987,569	436,105	823,106
1931	7,978,729	24,164,463	574,506	1,659,787
1930	7,404,223	22,504,675	525,693	1,908,900
1929	6,878,530	20,595,776	57,078	1,701,467

¹ Provisional figures.

In 1933 the States expended 97.3 percent of all Federal funds available for vocational education. Each year since 1920 the States have used over 90 percent of these Federal funds, and in recent years the small amounts unexpended have represented budgetary margins, and balances in special funds. The percentage expended each year is shown in Diagram III.

DIAGRAM III.—*Percentage of Federal appropriations for vocational education used by States, by years, 1918-33*

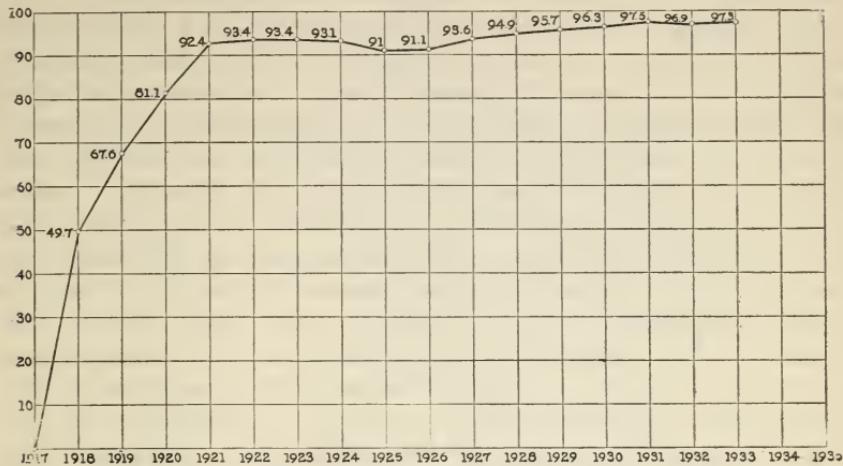


Table 5 shows expenditures of State and local money per dollar of Federal money expended under State plans in the several fields of vocational education and for vocational rehabilitation of disabled civilians, by years, 1918-33.

TABLE 5.—*Expenditure of State and local money per dollar of Federal money expended, by years, 1918-33*

Year ended June 30—	Vocational education					Vocational rehabilitation
	Total	Agriculture	Trade and industry	Home economics	Teacher training	
1933 ¹	\$2.90	\$1.81	\$4.92	\$3.19	\$1.38	\$1.15
1932.....	2.97	1.77	5.06	3.52	1.41	1.20
1931.....	3.03	1.88	4.74	4.42	1.45	1.19
1930.....	3.04	1.76	4.69	5.47	1.35	1.30
1929.....	2.99	1.90	4.17	7.11	1.33	1.24
1928.....	2.77	1.67	3.90	6.56	1.29	1.36
1927.....	2.65	1.67	3.67	5.88	1.33	1.23
1926.....	2.54	1.70	3.43	5.28	1.25	1.10
1925.....	2.73	1.72	3.85	6.36	1.30	1.18
1924.....	2.90	1.77	4.38	7.27	1.26	1.25
1923.....	2.98	1.78	4.58	8.61	1.21	1.26
1922.....	2.85	1.83	4.48	7.62	1.22	1.36
1921.....	2.76	1.85	4.26	8.47	1.19	-----
1920.....	2.45	1.74	3.85	5.77	1.25	-----
1919.....	2.17	1.67	3.08	3.78	1.31	-----
1918.....	2.65	1.71	4.00	4.79	1.21	-----

¹ Provisional figures.

ANTICIPATED UTILIZATION OF FEDERAL FUNDS UNDER STATE PROGRAMS

Under the vocational education and vocational rehabilitation acts, the States are required to plan out their work each year in advance, and the Federal agency for administering these acts is required "to ascertain annually whether the several States are using or are prepared to use the money received by them in accordance with the provisions" of the acts. The Federal agency is required further to submit to the

Bureau of the Budget estimates of expenditure of Federal funds under State plans early in each year for the succeeding fiscal year.

In compliance with these requirements an inquiry was addressed to State directors of vocational education in July 1932 to ascertain whether the States were prepared to use the full amount of Federal funds appropriated or authorized to be appropriated by Congress for the fiscal year ending June 30, 1934. A similar inquiry was addressed to State directors in August 1933 covering the fiscal year ending June 30, 1935. State directors were requested to state what would be the probable effects upon vocational programs in the States if the George-Reed Act, authorizing appropriations for agricultural and home-economics education should not be continued after June 30, 1934. Answers to these inquiries have been received from the State directors of vocational education in the 48 States, Hawaii, and Puerto Rico. The directors report that they are prepared to use Federal funds in 1935, including funds under the George-Reed Act. They call attention to the fact that State and local appropriations must be made in advance, that already in a number of States appropriations for 1935 to match Federal funds have been made, that these funds are essential to maintain established departments, and that emergency programs of relief and recovery necessitate not only continuance of all established vocational departments supported through the George-Reed Act, but a further extension of these programs.

State directors indicate the following consequences as inevitable if the George-Reed funds should be discontinued: (1) That many departments of vocational agriculture and a majority, if not in some States all departments of home economics will be eliminated; (2) that State funds already appropriated and contingent on the receipt of Federal funds will of necessity lapse; (3) that it will not be possible to utilize buildings and equipment specially provided for vocational departments of agriculture and home economics representing large expenditures of public funds; (4) that elimination of vocational work will result in still further overloading of academic courses with the consequent impairment of the work of the entire school system; (5) that rural communities will be even more severely taxed than they are now to meet the increased load if Federal support is withdrawn; (6) that contributions made by vocational departments under the George-Reed Act to relief and recovery programs in farming and homemaking will be abandoned; (7) that States will be unable to provide vocational training for large numbers of the unemployed; (8) that unemployment will be increased by discharge of vocational teachers now working under the act; and (9) that the morale of the State and local personnel will be seriously injured.

During the past year States and local communities have experienced serious embarrassment as a result of the reductions in the amount of Federal funds made available below the amounts originally appropriated or authorized by Congress to be appropriated for 1933. They have been further embarrassed by the uncertainty attaching to these appropriations, which has extended up to the beginning and even after the beginning of the fiscal year of the State or local community. Appropriations by the vocational education act of 1917 for allotment to the States for the fiscal year beginning July 1, 1932, were reduced by the Economy Act of June 30, 1932, from \$7,157,977.62 to \$6,442,179.81, and the appropriation under the George-Reed Act for this same fiscal year was reduced by the Independent Offices Appropriation Act of June 30, 1932, by \$500,000 below the amount authorized to be appropriated for this year.

Similar uncertainties as to the amounts of Federal money which would be available for the fiscal year beginning July 1, 1933, developed late in the fiscal year ended June 30, 1933. On June 16, the Bureau of the Budget advised that section 18 of the Executive order of June 10, 1933, "providing for abolishing of 25 percent of the functions of cooperative vocational education and rehabilitation, is to be construed as providing for a reduction of 25 percent in the appropriations which were made for your Board for the fiscal year 1933." Subsequently by Executive order of July 26, 1933, the effective date of section 18 of the Executive order of June 10 was deferred until 60 days after the convening of the second session of the Seventy-third Congress in January 1934. These uncertainties have meant that local communities could not be informed what amounts of Federal funds would be available for paying in part salaries of vocational teachers until after the beginning of their school years, when all budgetary commitments should have been consummated.

The States have been kept fully informed of these developments and have appreciated the extraordinary character of the emergency situation. In the interests of economy and efficiency, however, in the expenditure of local and State as well as of Federal funds under approved State plans, such uncertainties extending over into current fiscal years in these communities must obviously be eliminated to the full extent possible.

The States cooperating with the Federal Government in the vocational rehabilitation of disabled persons have appropriated State and local funds for 1934 in excess of the Federal funds available, indicating by these appropriations their intention of continuing their support of the program, and the anticipated utilization of all available Federal funds.

THE STATE OF WASHINGTON ACCEPTS THE VOCATIONAL REHABILITATION ACT

During the last session of its legislature, the State of Washington accepted the Federal Vocational Rehabilitation Act. Service for the vocational rehabilitation of disabled persons was accordingly initiated July 1, 1933. Forty-five of the forty-eight States are now cooperating in this work.

THE PROBLEM OF THE PHYSICALLY DISABLED

Among the principal causes of unemployment, even in normal times, must be included disabling accidents to workers, disease, and congenital defects. In periods of widespread unemployment all the difficulties confronting the physically handicapped worker are accentuated. In many thousands of cases, however, the physically disabled man or woman can even in such periods be trained for and placed in some useful employment, and be thereby rendered economically self-supporting. During the past year under State programs nearly 11,000 such men and women have in fact been so qualified for employment in some occupation for which their particular physical disability does not any longer constitute a vocational handicap, and more than half of these vocationally rehabilitated men and women have been placed permanently in employment. At the close of the year some 25,300 other physically disabled men and women were reported on the rolls of the State rehabilitation services as in process of being vocationally rehabilitated.

All of these dependent, disabled, and unemployed men and women on State rolls, when reported as rehabilitated, will have received expert vocational guidance leading to the selection of some occupation in which their disability will not be a vocational handicap, will have been thoroughly prepared for this occupation, placed in employment in it, and followed up for a period after placement to insure permanent restoration to self-supporting status.

Our national program of vocational rehabilitation of the physically disabled dealing with one aspect of the unemployment situation, has continued during the past year to report steady gains in its achievements. More disabled men and women have been rendered self-supporting during the past year than in any earlier year, although the conditions under which the program has operated have been much more difficult than in any earlier year. It is significant that even under these conditions of extraordinary difficulty the States generally have succeeded in maintaining their services, and that steady development of the national program has continued. All of the 45 States cooperating with the Federal Government in this program of vocational rehabilitation and occupational readjustment

for disabled men and women have indicated their intention to continue their joint support of the program and to expand their services further through provision of additional State and local funds.

As a further indication of development, it may be noted that the Federal act providing for the establishment of a national system of employment offices, becoming effective July 1, 1933, requires State employment office systems to cooperate with State vocational-rehabilitation departments. Plans have already been formulated in a number of States for giving effect to these cooperative relationships, and as the employment system is developed this cooperation between employment and vocational rehabilitation services will expand. Such cooperation will serve not only to prevent overlapping and duplication of service to the disabled, but also to facilitate administratively a unified and constructive service.

In the field of emergency relief for the unemployed, also, plans for cooperation of the national and State vocational-rehabilitation services with the National and State Emergency Relief Administrations are being developed to the end that during the present period of economic depression and unemployment a larger proportion of disabled persons may be taken off the rolls of those dependent upon public relief, and be prepared for and placed in some employment in which they will be self-supporting.

SERVICE TO THE STATES

Rendering service to the States for the promotion of vocational education and of vocational rehabilitation, the conduct of research in these fields, and administration of the several acts defining the purposes for which Federal money may be expended under approved State plans, are major functions of the Federal office.

The Federal acts expressly provide for cooperation with the States in the promotion of vocational education in the fields of agriculture, trades and industries, and homemaking, and for promotion of vocational rehabilitation of persons disabled in industry or otherwise and their return to civil employment.

All of this service during the past year, as in other years has been rendered in response to requests from State boards. It may be noted that service of this character does not imply any assumption of administrative responsibilities in the States or local communities in the organization or conduct of any vocational schools or classes. All such schools or classes which receive financial aid under the Smith-Hughes Act are organized and conducted by State and local authorities under State plans formulated in each State by the State board for vocational education, and all teachers are employed by State and local communities, and are paid out of Federal, State and local funds under reimbursement policies formulated by the States. On requests

from the States, assistance is given by Federal agents in the development of programs. Inquiries and requests for service from the States each year necessitate a large volume of correspondence on educational and technical problems, and in some cases the preparation of reports by the agents.

During the past year Federal representatives have assisted State officers in perfecting State plans under which local vocational programs are conducted; participated in conferences with State directors, supervisors, teacher trainers, local administrators, teachers, employers, and employment and placement agencies; prepared, assembled, and distributed material to aid the States and local communities in building up their programs; assisted in making surveys and special studies within the States; and cooperated with national associations and committees interested in vocational education.

In Hawaii an agent of the Trade and Industrial Education Service conducted two professional improvement courses for vocational teachers extending over a period of 3 weeks, and in a number of States trade and industrial agents have conducted, in response to requests originating in local communities, instructor-training courses for fire-department officers. They have cooperated with the United States Bureau of Indian Affairs in planning out a survey to formulate a vocational education program for Indian girls in the Northwest; with the Department of Justice in planning for organization of vocational classes for women in penal institutions; and with bureaus in the Departments of Agriculture, Labor, and Commerce, interested in the promotion of vocational education. Accompanied by State supervisors or other State officials, Federal agents have visited vocational schools in every section of the country to assist these schools with expert advice in improving their vocational programs. These services, although they have been exceedingly varied, have been nevertheless essentially similar in character to services rendered in other years. The trade and industrial staff has, however, during 1933 responded to numerous requests for service of an emergency character in assisting the States and local communities to develop vocational programs of emergency training and relief in the unemployment situation.

In the field of agriculture, as in other fields, Federal agents have assisted State supervisors to formulate their annual programs of work, have devoted much effort to helping States organize emergency programs, assisted State supervisors in putting over their programs with local teachers, and have surveyed teacher-training institutions in a number of States, making recommendations for improvement. They have assisted in the formulation of special courses of instruction to prepare persons who have for one reason or another abandoned other occupations to enter farming under the local conditions obtain-

ing in their respective communities. Up-to-date subject matter has been made available and organized for vocational courses, and special phases of the program, such as part-time and evening instruction for farmers have been promoted.

Funds made available under the George-Reed Act of 1929 have made possible some expansion of the home economics education staff to meet more adequately the needs of the rapidly expanding programs being developed in this field. School administrators have during recent years been attempting to build up programs in home-making which would function effectively in the homes of their communities, and their demands for assistance in this effort have greatly exceeded the capacity even of the expanded staff. Nevertheless, the expansion of the service has made it possible to build up more effective plans for cooperation with the States, to participate more generally in State and local conferences of homemaking supervisors and teachers, and to cooperate more effectively with State supervisors and teacher-training staffs. Information required in dealing with local needs and problems has been prepared, compiled, and distributed to each State, and aid has been extended to State and local staffs in dealing with the homemaking problems of families of reduced incomes, and of those living on relief funds. Services have been rendered also in helping the States to develop programs to meet the needs of special groups, such as the foreign-born, and certain native-born groups whose social and economic status has made their home problems unique and difficult. In nearly all States, also, the increase of adult education in homemaking under the George-Reed Act has been reflected in increasing demands for service.

Special services rendered to the States in the field of commercial education have included aiding the Wisconsin State Board for Vocational Education in developing its experimental pioneer programs of training for workers employed in stores and in selling occupations; making a brief survey of the classes for unemployed commercial workers, and outlining a plan for organizing additional classes for unemployed salespeople and store workers in New York City; aiding the State supervisor of trade and industrial education in Delaware in improving a local program of vocational education in Wilmington for store managers and salespeople; aiding the Pennsylvania State Board for Vocational Education in developing a cooperative class in retail selling in Williamsport; conducting a 1-week conference for commercial teachers in the part-time schools of Tennessee; aiding the Office of Indian Affairs in developing in Haskell Institute, Kans., experimental classes for commercial pupils; aiding the director of the Department of Vocational Education of Ohio State University in organizing a program for training commercial teachers; and organization and conduct of a conference on reorganization of commercial courses in rural and small-town high schools.

Services rendered by agents of the Rehabilitation Service have included participation in State rehabilitation staff conferences, and in general conferences on programs for cooperation between, for example, State emergency relief administrations, State employment services, agencies for service to crippled children, and State boards for vocational education. They have assisted in promoting programs in the States generally; in formulating State plans; in promoting local participation in the State program under plans of cooperation between individual cities and the State; in interpreting rehabilitation policies in terms of individual cases; in promoting needed legislation in the States; and in improving the record, accounting, and bookkeeping systems in State offices. In each case the service rendered has been in response to a request from the State for assistance, and the particular service rendered has been determined by the problems and needs developing in the State.

RESEARCH IN THE FIELD OF VOCATIONAL EDUCATION

An inquiry undertaken at the request of the American Vocational Association has been in progress throughout the year. The executive committee of this association, at a meeting held in New York City in December of 1931, approved a recommendation for appointment of a committee of the association to study changing economic and social conditions, and problems involved in adapting programs of vocational education to these changes. In February of 1932 the executive committee voted to request the Federal service to assume responsibility for making this study, on the understanding that a committee of the association would serve in a cooperating and advisory capacity. In the following March the standing committee of the Federal service approved the proposal of the association and in June a conference of the committee members and others was called to discuss the projected research. Subsequent conferences with the advisory committee of the association were held in October 1932 and May 1933.

Social and economic changes surveyed in this study, as they affect vocational requirements being imposed upon wage earners, farmers, and homemakers, include the increasing mechanization of processes and increasing utilization of mechanical power in industry and agriculture, with the resultant displacement of labor, changing demands for skill, and insecurity of job tenure. Among other tendencies of significance for vocational programs are the increasing adoption by large corporations of scientific practices of personnel selection; the increasing demand for, and the rising standards of efficiency; the increasing specialization of processes and jobs; the increasing difficulty for workers of learning on the job in highly mechanized industries; the increasing demand for broad technical knowledge; the increasing need for interpretation in terms of trade techniques and farm practices.

of the cumulating results of technological research; the increasing responsibilities of vocational programs in dealing with such large population drifts as the migration from farm to city, and from city to farm; the increasing need for development of live-at-home programs, especially in a period of reduced incomes and of widespread unemployment; the increasing educational disability of rural areas; the increasing urbanization of the home, socialization of the homemaker's job, and rising standards of efficiency in homemaking; and the rising age of entrance into employment, with the very serious resultant social problem of what to do with the 14- to 18-year-old boy or girl who is being barred from employment to a more advanced age.

In its larger aspects the problem presented in this inquiry may be defined as the problem of determining in what ways vocational programs can be made to function effectively in maintaining for our workers continuous occupational adjustment, thereby avoiding as far as may be possible displacement and unemployment in the face of an intensely dynamic economic situation. In this matter of vocational training and adjustment the obligation of society extends to workers of all classes. And it is not limited to youth. It extends to workers of all ages, employed and unemployed, more particularly in the present situation to adult workers being thrown out of occupational adjustment by the continuous economic, technological, and social changes. These changes present unlimited possibilities for advancing society's welfare, but they present at the same time serious problems of economic insecurity of our workers, with which society and specifically our programs of vocational education supported out of public funds must deal.

Other research in progress during the past year has included a survey of the pulp and paper industry and elaboration of a scheme for training workers in this important industry. This study has been checked by officials in 23 establishments as regards the processes of manufacture and the analysis of jobs in the industry, and instructional units for training personnel have been outlined on the basis of the survey. A similar study has been made of the foundry industry in 15 plants in 12 cities of one State. An analysis and compilation of Census data for States and local communities has been made showing occupational changes and the significance of these changes for vocational programs. A follow-up study, begun in 1927, to determine what becomes of the trade-school graduate has been continued. A bulletin on "Vocational training for aviation mechanics" has been completed and made available for distribution; and material has been prepared on new types of industrial classes, on special problems in vocational education, on training workers in oil fields, and on procedures to be followed in organizing and maintaining a vocational program in line with local community needs.

In the field of vocational agriculture a study has been in progress to determine the needs of out-of-school farm boys for vocational training. Also a study of placement opportunities for farm operators enrolled in agricultural part-time schools—the first systematic study of placement in the field of agricultural education of less than college grade. A follow-up study of former students of vocational agriculture now engaged in farming as operators has been in progress. One cooperative research has dealt with the organization and conditions essential for successful functioning of agricultural programs in small rural high schools. The results of research conducted in the Department of Agriculture have been analyzed and organized in separate publications for utilization by teachers giving vocational instruction in farm forestry, in grading feeder and stocker steers, in marketing poultry products, and in controlling loose smuts of wheat and barley. Two bulletins have been published, one on the organization and conduct of agricultural part-time schools; and one on the earning ability of farmers who have received, as compared with those who had not received, vocational training.

In the Home Economics Education Service a bulletin entitled "The home project in homemaking education" was prepared during the year, dealing with the selection, planning, and conduct of such projects in connection with systematic instruction in homemaking. Home projects provide practical training in homemaking, supplementary to the classroom instruction, as do the supervised practices or projects of students enrolled in vocational agriculture. The bulletin is based on a broad survey of experience in the States. These projects afford unique opportunities for adapting homemaking instruction to the needs and resources of individual families in planning and preparing food for the family that is adequate and can be provided within the food allowances of reduced incomes or grants of relief to dependent families; in preserving home-grown fruits and vegetables; in making clothing from materials on hand; or in planning recreation for the family at little or no cost. Superintendents and teachers generally bear witness to the outstanding values of home-project instruction given under the cooperative guidance of parents and teachers. Much effort during the past year has in this service been devoted to the coordination of the extensive research being conducted in the field of homemaking throughout the country.

A preliminary draft for a bulletin on trends in commercial occupations was partially prepared during the year. It has become apparent on a survey of trends in employment of clerks, sales people, and other commercial workers, that the number and proportion of workers in these employments have been increasing rapidly in recent decades. In 1930, 1 in 8 workers was engaged in some recognized commercial pursuit. Research in the commercial field during the past year in

response to requests from the States has included a brief survey of classes being conducted for unemployed commercial workers in New York City and outlining a plan to be followed in expanding this program; and two reports, one for the superintendent of schools in Wisconsin, and one for the director of vocational education of Kentucky, on the relation of high school commercial courses to commercial occupations in the State. Tentative drafts of objectives for commercial courses on a vocational level were prepared, one for the commercial section of the American Vocational Association, and one for the Department of Business Education of the National Education Association.

During the year material was compiled by the Rehabilitation Service for a bulletin on "Office procedure in vocational rehabilitation", which discusses forms, files, and procedures employed. A bulletin entitled "Administration of vocational rehabilitation—A statement of policies", published originally in 1926, was revised to bring the material therein up to date, and to include additional policies formulated since the original publication. Material was collected in the States on cases of physically handicapped persons rehabilitated by the States during the fiscal year 1931-32, the purpose of the study being to ascertain the means by which these disabled persons have secured employment after having been prepared for it through rehabilitation procedure. Material was collected also on rehabilitation cases undertaken in the States and subsequently closed without effecting complete rehabilitation; and some material was gathered for a study of small business enterprises as providing suitable undertakings for rehabilitated persons.

ADMINISTRATION OF THE FEDERAL ACTS

Administration of the several acts under which Federal money is allotted to the States—in the total amount under all acts in 1933 of \$9,161,000—for expenditure under State plans constitutes, as has been noted, a third major function of the Federal staff, in addition to its functions of service and research. Allotments under the several acts for the year ended June 30, 1933, were in the following amounts:

Funds appropriated for allotment to the States; year ended June 30, 1933

Act	Basis of allotment	Amount
Total.....		\$9,161,300
Vocational education:		
Smith-Hughes Act, total.....		6,450,300
Vocational agriculture.....	Rural population.....	2,724,300
Vocational trade and industry.....	Urban population.....	2,745,000
Vocational teacher training.....	Total population.....	981,000
George-Reed Act, total.....		1,500,000
Vocational agriculture.....	Farm population.....	750,000
Vocational home economics.....	Rural population.....	750,000
Vocational rehabilitation.....	Total population.....	1,097,000
Hawaii.....		27,000
Puerto Rico.....		75,000
District of Columbia, vocational rehabilitation.....		12,000

Allotments of these appropriations involves determination of the amount of allotments to which each State is entitled on the basis of its total, urban, rural, or farm population at the last census; determination of unexpended balances in State treasuries carried over from allotments in the preceding year; verification of State financial reports of expenditures during the year, and disallowance of any expenditures found to have been made not in accordance with the provisions of the acts making the appropriations; and finally certification to the Treasury of the quarterly or semiannual payments to be sent to the States under each act.

These procedures necessarily involve a very considerable amount of clerical work in computing allotments, balances, and payments, and in preparing certifications to the Treasury. They involve, also, auditing of State reports by agents and other members of the staff who are entirely familiar with the statutory provisions under which the Federal money is made available for expenditure under State plans. Finally they involve each year a very considerable amount of correspondence with State officials incidental to the distribution of report forms, the securing of reports, the auditing of the reports, and the notification of payments certified to the Treasury.

THE PROBLEM OF THE 14 TO 16 YEAR OLD BOY OR GIRL

Undoubtedly the most serious problem emerging during the past few years in the field of education has been the problem of what to do with the 14- to 16-year-old boy or girl, who has completed the requirements of compulsory full-time school attendance and is still too young for wage-earning employment. The period of compulsory full-time school attendance has been extended in some States to 16 years, with provision for part-time attendance in continuation schools for employed young workers even beyond that age, but in a majority of States there is a gap between the age of release from compulsory full-time school attendance and the minimum age of employment as fixed in child-labor legislation, or as determined independently by industry, which of its own initiative has been more generally refusing to employ workers under 16, and even in some occupations under 18 years of age.

This gap comes at precisely that age of adolescence when guidance and direction are most essential for the future welfare of the boy or girl. Opportunities for employment of these youths, freely, or under work permits requiring part-time attendance at continuation schools, have been gradually diminishing over a period of years, but during the past year *codes prepared under the National Recovery Act have been so drawn as practically to eliminate all employment in these ages by fixing the minimum age of employment at 16 years.*

As regards the minimum age of employment, the policy written into these emergency codes will, it may be assumed, be continued as a permanent policy after the present emergency has entirely passed. So that the 14 to 16 year old boy or girl will not be permitted in the future to enter upon any wage-earning employment in competition with older workers. These young workers are not any longer wanted in industry. They are too immature for profitable employment. There is no economic necessity for their employment, and society has at last determined to eliminate the evils of child labor.

Under the vocational education act one third of the Federal funds provided for trade and industrial education, if expended in the States, must be expended for part-time schools, that is to say, for schools providing instruction during a part of the regular working time for young workers over 14 years of age. It would appear that these schools must in the future be operated almost exclusively for workers over 16 years of age. Also, it would appear that the 14 to 16 year old boy or girl must in the future continue on in full-time attendance at the regular day school, since it is inconceivable that public opinion or the interest of parents in the welfare of their children should tolerate complete denial of all opportunity to these 14 to 16 year old boys and girls either of employment or of continued education.

Obligation rests directly upon school authorities to face the problem of providing for this group of future citizens, who cannot benefit by further formal academic instruction, some alternative educational discipline from which they may be reasonably expected to derive benefit.

THE NEED FOR CONTINUOUS SERVICE FOR ADULT WORKERS

As regards training for skilled trades, vocational programs throughout the country have been largely developed on the traditional apprenticeship theory that a worker could be trained once for all in the technic of his trade, by serving a regular apprenticeship in it. For some of the training provided under indentures of apprenticeship, organized training in vocational courses has been substituted under conditions developing in our mechanized industries to which traditional apprenticeship methods of training could not be adapted. But the theory that the worker could be trained once for all, either as an apprentice or as a pupil enrolled in a vocational course or by some combination of apprenticeship and organized training, has persisted. This theory assumes a static condition of the industrial arts, which was true of these arts over a long period preceding the development of our power-driven machine industries, and preceding the progressive and accelerating applications of science in developing new processes and in improving the technics of production. But it is not valid under present-day conditions.

Conditions of production are different today from conditions in any earlier period. For vocational programs the more significant fact is that no assumption that they are static can be justified. Rather it is true that technological advance is proceeding at such a rapid pace that the thoroughly trained artisan of today may be confronted tomorrow with the demand for a new trade skill or technic for which his past training and experience has little or no value. Technological advance is continuously devaluing and eliminating the need for the acquired skills and technics on the one hand, and on the other continuously setting up new requirements for the workers.

While changes of this character are continuously taking place in one or another industry or line of employment, they are as regards individual industries and individual workers accidental and unpredictable, being dependent upon the accidental progress of invention and science in the field of production. Obviously no vocational course can take account of these changes before they occur, and train young workers for the new technics which are certain to develop from time to time during their life period as adult workers. The need for additional training may develop for the adult worker at any age, and this need can be met only by maintaining a training service paralleling developments in the trade, and made available to the adult workers on occasion as the need for training develops.

While technological advance resulting from the application of science and the progress of invention is more commonly thought of in connection with our manufacturing industries, changes of this character extend over into other fields of vocational training, developing in these fields corresponding needs of training service for adult workers. In all fields, moreover, the need of the adult for continuous training service is urgent for other reasons. In agriculture, for example, many millions of dollars are expended out of public funds each year for technological research. As reported by the Department of Agriculture, research of this character being conducted by experiment stations in 1931 included over 5,000 separate projects in agricultural chemistry, soils, fertilizers, crops, genetics, horticulture, forestry, plant diseases, animal production, dairying, agricultural engineering, foods, and other lines. On the basis of this research an immense volume of literature is prepared each year. It is no reflection whatever upon the farmer to say that he is finding it impossible to keep up with this research even in his own particular line of farming. His full-time job is farming rather than following the advance of technological research. Nevertheless, the single purpose of the research is to help the individual farmer, and one principal responsibility of the vocational teacher is to render continuous service in his community to the adult farmer in interpreting the results of this research in terms of everyday farm practices.

In the field of homemaking, also, the need of the adult for service is a continuing need. Science is continuously occupied with discovering new ways and means of safeguarding the family health which, if they are to benefit society, must be carried over from the field of science into the field of everyday homemaking. Obviously the homemaker cannot unassisted follow the progress of medical science and modify her homemaking practice accordingly. In this business of safeguarding health—which has been estimated to cost the community some \$3,500,000,000 a year—as well as in many other phases of the business of safeguarding the family welfare, the homemaker needs every aid that can be extended to her.

INCREASING NEED FOR TRAINING TECHNICIANS

With the increasing mechanization of industry and use of mechanical power, and the rapid accumulation of the results of scientific research of vocational significance in many lines of employment, the demand for technical experts has increased correspondingly in recent years, and increased, it would appear from recent surveys, out of proportion to the increase in provisions being made in vocational programs for training such workers.

The increasing value of broad technical knowledge in industrial fields is generally recognized. For the industrial technician the training is of a subprofessional grade, as compared with the training of the industrial engineer, and the demand for this subprofessional training appears to have been in general less adequately met than has the demand for training industrial engineers. It may be added that the training required by the technician is a type of training which can commonly be most advantageously provided in organized courses, and a type of training also which industry can seldom provide economically if at all.

THE BACK-TO-THE-FARM AND FARM-FACTORY MOVEMENT

Each year hundreds of thousands of urban workers with their families, voluntarily or under pressure of economic necessity, leave the city for the country, and other hundreds of thousands of farm boys and adult farmers with their families leave the farm for the city. This interchange of population between city and country is always running in large volume. The urban worker moving out into the country must learn to live there by farming or possibly by some other trade—probably not his old one. He and his family must learn to live in the country, where all the conditions of earning a living and of living in the home are different from those to which they have been accustomed.

It is, of course, not the net population drift either into or out of the city that measures the dimensions of the adjustment problem set up

for vocational education, but is rather the mass population change both ways.

In the present situation of widespread unemployment in industrial centers, however, and for several years back it happens that the net drift has been away from the city—a net back-to-the-farm movement. Moreover, in this emergency the National Government has set aside a large sum of Federal money for the express purpose of moving families out of certain industrial and mining centers where they could not be self-sustaining, and establishing them in homesteads organized in small rural communities where they can become self-sustaining.

As an initial move under this national program a small group of West Virginia coal miners, proved by adequate tests to be "potential farmers", have been selected with their families "as the pioneers on the first Federal farm-factory project." The homes of these selected miners were visited and the homemaker interviewed, since it was realized that it was essential that she, as well as the miner himself, should be fit for the undertaking.

Society has definitely assumed responsibility for enabling these miners to become self-supporting in a rural community to be organized by them under Government supervision and with the aid of Federal funds. They are "potential" farmers, and are to become real farmers. This means that they must be taught how to farm for home consumption. But more than this, since it is a "farm-factory" rather than simply a farm project they must be taught also to engage in some subsidiary craft or trade, suitable for the rural community or the home by which they can supplement the family income.

This national enterprise may present to vocational teachers an opportunity for cooperative service of far-reaching social value. The conditions with which the present emergency program proposes to deal are not essentially emergency conditions. They obtain more or less generally in all periods in some localities, and the problems presented to vocational education are essentially permanent rather than emergency problems.

PART-TIME FARMERS AND GARDENERS

The drift of population away from urban centers during the past few years has not been altogether—although it has been in some large measure—a going-back-home or a back-to-the-farm movement of unemployed workers with their families. It has embraced also in increasing volume a drift out of congested urban areas into nearby suburban districts, where the worker could secure a piece of ground for farming on a small scale or for a home garden.

Even the worker who has held his job in the city continuously has in many thousands of instances moved his family out into the country.

He may have continued to be an urbanite, working at his regular job full time or part time, or employed casually at odd jobs, but he has planted "one foot in the country", and has in many instances become a part-time farmer or gardener. In a majority of these cases he has probably brought with him little if anything in the way of capital resources, or knowledge either of farming or gardening. He has planned to cultivate his small plot of land mainly for home consumption, and has in many instances received the cooperative assistance of social agencies in planning to do this.

The problem presented to local programs of vocational agriculture by such part-time workers in agriculture, whose number has been rapidly increasing in recent years, is obviously different from that presented by the adult farmer or the farm boy engaged in or preparing to engage in some type of farming as a full-time business. The need of the suburbanite taking on gardening or small farming as a side line is for the development of a live-at-home program, rather than of a technical farming or farm-marketing program.

This dispersion of urban populations, and development of part-time gardening or farming in suburban areas as a means of eking out family incomes, may be expected to continue in increased volume in the future. Improved facilities for transportation may be indicated as one condition justifying this expectation. The automobile and other means of transportation are bringing a wider range of suburban areas within the residential district of urban centers, and making it possible for the urban worker to live in the open country where the conditions of living for his family are more favorable than those of the city.

COOPERATIVE EFFORT UNDER LIVE-AT-HOME PROGRAMS

For these urban families living in the country the problem of developing live-at-home programs breaks over into the field of home economics, since in any rational procedure the first step in farming for the family, even on a part-time basis, must be to formulate a budget of family needs in terms of foods that can be economically produced at home. Defining these family needs is a problem in home economics, while supplying them from the home farm or garden is an enterprise in the field of vocational agriculture.

In this situation a challenging opportunity is presented to vocational teachers of home economics and of agriculture for cooperative effort in helping these hundreds of thousands of urban families with "one foot in the country" to plan out and successfully carry out feasible live-at-home programs.

The farm-factory projects, being undertaken by the National Government, are even more broadly cooperative projects in vocational education under public supervision and with Federal aid.

Each such undertaking is a joint project in vocational agriculture, vocational trade or industry, and vocational homemaking. In the case of each family the industrial worker must be taught to farm for home consumption, and to work in off seasons at some new trade, while the homemaker must be taught to budget her needs for food and other necessities, and generally to conduct the home under a live-at-home program.

THE WAGE-EARNING HOMEMAKER

At the census of 1930 over 3,000,000 married women were reported to be gainfully employed. This total does not include all married women who were contributing to the family income, but only those reporting some gainful employment as a principal source of income. On comparison with earlier years the census found that the proportion gainfully occupied among married women had been increasing markedly over a considerable period in all sections of the country. It ranged in 1930 from 5.9 percent in North Dakota to 24 percent in South Carolina, and in cities of 100,000 or more population, from 4.6 to 33.4 percent.

Separate returns were made at the census of 1930 for "homemakers", including in this class the woman member of each family, exclusive of hired housekeepers, who was responsible for the care of the home. Of these homemakers nearly 4,000,000 or 13.8 percent were reported to be gainfully occupied (3,923,516 in a total of 28,405,294). Four out of five of the wage-earning homemakers were employed away from home as professional workers (388,000); office workers (501,000); industrial workers (737,000); servants, waitresses, etc. (958,000); saleswomen (272,000); or workers in other occupations (298,000).

Surveys in different localities of families with earning wives or mothers have found that in many instances young children must be left to their own devices, while the homemaker under the pressure of economic necessity is working away from home. Mothers of very young children may attempt to solve the problem of combining homemaking with wage earning by securing wage-earning employment at home, but such employment is not available in all cases.

The homemaker who must combine wage earning employment at the home presents a difficult problem to homemaking programs. In the local situation the problem may be of large or small dimensions according to the economic status of the homes in the given community, but the needs of the wage-earning homemaker for expert assistance in safeguarding the welfare of the family may be very different from those of other homemakers, and may be at the same time extremely urgent. The increasing tendency of homemakers to add wage earning to their homemaking responsibilities is one to which those responsible for developing local programs must give serious consideration.

VOCATIONAL TRAINING AS A MEANS OF INDUSTRIAL RECOVERY

During the past year emergency vocational programs have been organized to meet the needs of unemployed workers, and during the last months of the year plans were formulated for extending these programs on a nation-wide basis, under arrangements for cooperation of established national, State, and local agencies of vocational education with the newly organized National and State emergency relief administrations.

A fact of large significance for industrial recovery programs in the present situation is that even trained workers, who have been displaced or let out in the period of recession, can in a large proportion of instances never be taken back on the pay rolls of industry at their old jobs, either during or following the period of resumption. For industrial recovery their training and experience will have become misfit training and experience as a result of technological advance in all industries. Following any period of depression industrial recovery is always on a new basis. Old processes and equipment have been permanently discarded, and more economical processes calling for new trade skills are being introduced.

Vocational training for these new technics is as important an item in the program of industrial recovery as it is in the program of emergency unemployment relief, since industry cannot possibly resume activities on the new basis with a labor force untrained in these technics.

It follows that as business resumes in the immediate future, the problem of recovery both for industries and for workers will be not a problem of getting the millions of unemployed workers back on their old jobs, or on any other jobs for which their acquired training and experience has fitted them. For millions of those now unemployed traditional trade skill and occupational experience, acquired in the predepression period, will very generally have gone into the discard as part of the price society must pay for resumption of activities at all under the intensified competitive pressure for economy which always characterizes a period of recovery. Industrial recovery and elimination of unemployment will accordingly be not simply a placement procedure of returning labor to jobs for which they are fitted, but rather a training procedure of preparing labor for the new jobs that have become available.

It is highly essential that State and local administrators of vocational programs and vocational teachers throughout the country shall realize that this retraining of workers of all ages in new technics is bound to become in the near future—is in fact already becoming as unemployed workers are being put back on the pay rolls of industry—a prime responsibility of these programs; and that vocational education must, if it is to justify itself to the community which has provided financial support out of public funds for such education, *function effectively as one social agency of industrial recovery.*

MAINTENANCE OF OCCUPATIONAL ADJUSTMENT

It has been noted that science and technology "have helped form a society in which chronic insecurity is such a factor in the lives of the majority of men and women that insecurity and the fear it engenders have come to be counted as the chief motives which drive men to work, achievement, and thrift." Many factors undoubtedly enter into this situation. The problem is not a simple one, but the evidence is conclusive that insecurity for the worker has developed more or less in proportion, as under rapidly changing conditions, his past training for and experience in his occupation has become inadequate or misfit training and experience, and has tended to get out of line with the new requirements being imposed upon him by scientific and technological advance. To this extent the indicated remedy must be found in more adequate and practical vocational training based upon these new requirements.

Maintenance of occupational adjustment—which means avoidance, so far as possible, of the displacement and unemployment of labor commonly consequent upon scientific and technological advance and upon other social and economic changes in the conditions of employment—is in its technical aspects one large responsibility of vocational education. In its broader aspects the problem of maintaining occupational adjustment throughout our working population is, of course, a problem to the solution of which many other agencies, public and private, as well as vocational education must contribute. But whatever the contribution of other social agencies may be, it will always be true that *keeping labor fit for useful employment under constantly changing conditions and requirements being imposed upon the worker will be the special job of vocational education.*

THE NEW DEAL IN SECONDARY EDUCATION

The increasing economic insecurity of the adult worker in practically all fields of employment, and the careless abandonment of the youth of the country, at least in some communities, to idleness and aimless drifting or at best to misfit educational discipline during the years when they particularly need aid, guidance, and a discipline that will have a life-long practical as well as cultural value for them, undoubtedly present the more serious problems emerging in our present economic order.

With these problems vocational education has been continuously dealing since 1917, the year in which Congress enacted and President Wilson approved the vocational education act providing for national cooperation with the States in the promotion of vocational education under public supervision and adapted to the needs of the wage earner, the farmer, and the homemaker.

As a general proposition there can be no economy or assurance of welfare for the worker in any policy of leaving the worker untrained

for his job, or in taking chances that he may drift into some job for which he is or can eventually become fitted. Inefficiency is a waste of potential capacities of the worker, and the cost of this waste by and large undoubtedly exceeds the cost of rendering labor efficient. The aimless drifting of workers into certain fields of employment, whether or not there is a demand for their services in these fields, results in overcrowding of certain occupations and deficiency of workers in other occupations. The untrained worker is in the most overcrowded group of all—the group of unemployables. Vocational guidance and training is the rational social method of stopping this aimless drifting into overcrowded occupations, of drawing off surplus labor from these occupations into new and expanding fields of employment, and of *eliminating the unemployable worker by fitting him or some useful employment.*

INCREASING NEED FOR FEDERAL AID

Reports received from the 48 States indicate that the need for Federal aid to vocational education in practically every State is greater today than in any earlier period.

In part this need reflects today emergency conditions under which local and State funds available for public education have been very materially reduced, and vocational along with other educational programs correspondingly curtailed. Under these conditions the States and local communities have been forced to appeal to the National Government for increased cooperative assistance in preserving our public school system throughout the country. Not to respond to this appeal would be a national calamity.

In the field of vocational education the increasing urgency of the need for Federal aid reflects the rapidly changing social and economic situation, which during the past few years has been imposing upon local communities heavier burdens for occupational adjustment of workers being displaced by technological and other changes. All problems of administration and supervision of vocational schools, as well as of organizing instruction in them to enable them to function effectively in training our wage workers, farmers, and homemakers under rapidly changing conditions have become increasingly difficult.

Much has been achieved under cooperative national, State, and local leadership during the past decade and a half. Much more remains to be achieved. It is highly essential that our cooperative vocational program shall continue unimpaired, and that to assure continuous achievement in the future the appropriations provided in the Federal acts be continued in full amount. It is of vital importance that the period of the George-Reed Act, providing funds for agricultural and home economics education, be extended in accordance with the original intention of Congress.

ST. ELIZABETHS HOSPITAL

(Dr. WILLIAM A. WHITE, Superintendent)

On June 30, 1933, 4,981 patients remained in St. Elizabeths Hospital as compared with 4,930 on June 30, 1932, an increase of 51. This low increase is due mainly to the transferring of 115 Veterans' Administration patients to Veterans' Administration facilities during the month of June 1933.

The total number of patients under treatment during the year was 5,841, as compared with 5,579 for the preceding year, an increase of 262. The total number of admissions during the year was 911, the greatest number since 1923, as compared with 858 for the preceding year, an increase of 53, or about 6 percent. The total number of discharges for the year was 582, as compared with 401 for the preceding year, an increase of 181, or 31 percent. The total number of deaths for the year was 278, as compared with 248 for the previous year, an increase of 30, or about 12 percent. The total number of discharges and deaths, combined, was 860, compared with 649 for the preceding year, an increase of 211, or 32.36 percent.

There were 61 burials in the hospital cemetery, as compared with 43 the preceding year. With the cooperation of the War Department the bodies of 7 honorably discharged (indigent) service men were buried in the Arlington National Cemetery without direct money outlay; and 42 bodies were buried in Arlington Cemetery either at Federal or private expense, by outside undertakers. The remaining 168 bodies were removed by outside undertakers for private burial.

The daily average population was 5,036, an increase of 238 over the 4,798 for the preceding year, there having been an average increase of 196 for 1932, 212 for 1931, and 188 for each of the fiscal years 1930 and 1929, or a total of 1,022 patients since July 1, 1929.

Movement of patient population, fiscal year 1933

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1932-----							
Admitted during year ended June 30, 1932-----	2,651 443	760 179	3,411 622	901 177	618 112	1,519 289	4,930- 911
Total number under care and treatment during year ended June 30, 1932-----	3,094	939	4,033	1,078	730	1,808	5,841
Discharged as-----							
Not insane-----	11	10	21	2	1	3	24
Recovered-----	76	18	94	17	23	40	134
Improved-----	126	28	154	22	9	31	185
Unimproved-----	165	47	212	25	2	27	239
Total discharged-----	378	103	481	66	35	101	582
Died-----	91	83	174	58	46	104	278
Total of patients discharged and died-----	469	186	655	124	81	205	860
Number of patients remaining on rolls June 30, 1933-----	2,625	753	3,378	954	649	1,603	4,981

ADMINISTRATIVE DEPARTMENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products, shoes, brooms, articles made in the sewing and mending rooms, output of the bakery, laundry, power, heat, and lighting plant, mattress shop, etc., were valued at about \$775,000 during the year 1933, slightly less than during the previous year, due to the reduced prices both commercially and on account of reduction in salaries entering into the manufactured articles. Included in this amount were 290,000 gallons of milk, 23,000 gallons of ice cream, 14,500 dozen eggs, 4,550 pounds of chicken, 150,500 pounds of fresh pork, 939 bushels of tomatoes, 921,000 loaves of bread, 3,297,000 rolls, 48,000 pounds of pastry, 9,900,000 pieces of laundry, 5,900 brooms, 3,500 brushes, 2,387 mattresses, 2,153 pillows, 14,500 pairs of shoes and slippers; in addition, large quantities of farm and garden supplies, items of clothing, silage, steam, electricity, water, ice, and refrigeration, and many smaller items.

Diet.—The hospital continues the study of the diet. Not only is a greater variety of food being served to the patients and a larger variety of greens continued throughout the year but, also, efforts have been made to see that the food is served in a more appetizing manner. The general kitchen has been equipped with 10 sections of gas ranges and 2 gas baking ovens. These replace the old worn-out coal-heated ranges and ovens. A cafeteria has been equipped adjacent to the general kitchen and is used for the patients from several of the wards of the center building. Classes in dietetics for the student nurses were taught by two of the dietitians. These classes consisted of 22 hours of lecture work and 22 hours of laboratory work. Fifteen hours of lectures for the student nurses, on diet and disease, were given by one of the dietitians. The dietitians visit the dining rooms in each service at meal times; at this time complaints made by patients are immediately given attention.

Laundry.—The work of the laundry continues to increase. The number of pieces laundered during the past year was 9,900,000, about 1,500,000 increase over the previous year. Notwithstanding this increase, during the year there has not been an increase among the paid employees, there being two vacancies that have not been filled. Two presses and six double-sleeve ironers have been added to the equipment in order to meet the increased production. At the end of the year the work of the linen-exchange room was combined with the laundry, the forewoman in charge of the exchange room having retired.

Shoe shop.—Work in the shoe shop furnished employment to about 35 patients for about 5½ hours each day, except Saturdays and recreation days. During the past year there were manufactured in this

shop 6,624 pairs of house slippers; 3,189 pairs of men's oxfords, and 2,851 pairs of men's other shoes; 794 pairs of women's oxfords, and 1,012 pairs of women's strap slippers. There were 2,717 pairs of shoes repaired. In addition to that, in the same shop, there made 3,500 brushes of all classes.

Lawns and grounds.—The construction of new buildings, rearranging of roads, changing of elevations, and building of tunnels will result in completely changing the lawns and grounds and the general landscaping of the institution. Where there was formerly level ground there are now terraces; on what was formerly farm land, buildings have been erected. This will result in new lawns around these buildings and new walks and roads approaching same. It is necessary to sod and plant the lawns, lay out flower plots, plants, foliage and trees, and hedges, where feasible. Some small trees are in the nursery, and it is hoped to set out over 200 trees during the winter of 1933-34. Approximately 750 feet of new fencing was put up on the south boundary of the cemetery. New ground has been laid out to take care of the increased number of patients who are buried at the hospital.

Fires.—There were 11 small fires during the past year with approximate damage of \$805. From July 1, 1917, to June 30, 1933, the total loss from fire at the hospital was approximately \$4,042, an average of about \$250 a year. Fire extinguishers have been installed in the new continuous treatment buildings and tuberculosis building, and 15 replaced throughout the center building basement. During the year regular inspections have been made of fire hydrants, stairways, fire escapes, basements, hose closets, and attics, and where repairs were needed they were made. Six hundred and twenty-five soda fire extinguishers are regularly inspected and repaired, and once a year all extinguishers are refilled. The 155 Pyrene-type extinguishers are inspected, repaired, and refilled if needed. The fire siren is tested monthly, also the fire-alarm system. The fire pumps at the power house are tested weekly. The triple combination pumper is tested daily and put in service once a week. Tests are made of all fire hose once a year. Fire drills are held monthly, and weekly inspections are made with officers and privates of the District of Columbia Fire Department present.

Disbursements.—The total amount of money disbursed by the hospital from various appropriations and trust funds during the year was \$3,827,000. The total collections, including reimbursements to the regular appropriations, personal funds of patients, and pension trust funds, were \$2,551,000.

Supplies.—Orders were placed for supplies during the year amounting to \$1,441,000. Of this amount, \$830,000 was covered by formal contracts entered into by the hospital directly with the contracting

parties. These formal contracts entered into by the hospital included the male receiving building and furnishings for the continuous treatment buildings. There were 256 open-market contracts entered into by the hospital.

Personnel.—The total number of employees on the hospital rolls June 30, 1933, was 1,507, of which 1,414 were permanent employees and 93 temporary employees, there being a decrease in the permanent force of 52 and a decrease in the temporary force of 10, or a total of 62.

During the year legislation was enacted putting into effect what was known as the "legislative furlough", in accordance with which each employee had 2½ days' pay deducted each month and was permitted to take 2 days' vacation for the same period. Additional legislation was enacted terminating the legislative furlough at the end of March 1933 and in lieu thereof directing that 15 percent should be deducted from each employee's salary and the employee should be permitted to have not exceeding 15 days' vacation each year, said vacation being cumulative, such part as is not taken during one year to be placed to the credit of the employee, who could have the additional time off the following year or years.

The limitation on the filling of vacancies was continued and legislation was enacted directing that in reducing personnel such employees who had served the Government for a period of 30 years would be permitted to retire under the retirement act, if their services were no longer required. The legislative bill of 1933 pertaining to married employees was continued in force.

New construction.—The new tuberculosis building for 80 patients, completed at the close of the fiscal year 1932, was completely equipped and occupied.

The two continuous treatment buildings nos. 1 and 2, dining hall and kitchen building, were completed, equipped, and occupied during the early months of the year. These buildings are provided with many improvements over former buildings. They are 2-story buildings containing about 160 beds each, with large day-rooms and porches. In continuous treatment building no. 1, temporarily occupied as a male-receiving building, the basement contains a hydrotherapy department, occupational therapy outfit, and barber shop.

The kitchen in the continuous treatment buildings was built large enough to cook for about 1,600 patients. Only half of the equipment is installed at the present time. This kitchen contains the most modern up-to-date equipment of the various classes—gas ranges, electric ovens, and other equipment—has refrigerating rooms on the main floor as well as in the basement, adequate storing space, and the necessary utilities.

Plans and specifications for the male-receiving building were completed, advertisements placed, and an award made for the construction of this building. Its construction is now under way, and it is approximately 50 percent completed as of June 30, 1933. This building will have facilities for 400 patients and the necessary equipment for a male-receiving building.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year this department furnished occupation for 964 patients, slightly less than during the previous year. This work included weaving, sewing, toy-making, woodwork, basketry, etc. In the industrial department there were made 27,772 sheets, 9,430 pillow cases, 14,277 towels, 2,626 dresses. The woven articles consisted of 6,868 bath towels, 227 dresser scarfs, 1,200 rugs, and numerous other items, totaling 68,789, with an approximate value of \$25,156. Many of the articles made by these patients are for general use in the hospital, such as bed linens, dresses, etc.

Red Cross.—The Red Cross continued to maintain a hospital unit during the past fiscal year, consisting of 3 psychiatric social workers, one of whom is the field director, 3 recreation workers, and 3 secretaries. The psychiatric social workers are primarily concerned in case correspondence, and contact work. During the past year that office sent out 2,676 and received 3,667 letters concerning patients and their affairs. The letters and reports primarily were to secure psychiatric histories and to verify facts furnished by patients and relatives; to make previsit or predischarge investigations; to secure reports of the adjustment of patients on visit outside the District of Columbia; to secure information about and to effect the adjustment of financial problems in the patients' homes which might have been connected with or incidental to the patients' mental breakdown; to contact the local Red Cross chapters in the towns in which the patients' families live, so that they can take care of any social problems which may exist in the patients' homes; to locate missing relatives of patients; to establish patients' legal residences; to see that the children and wives, resident outside the District of Columbia, may have blood tests when advisable; to have patients' families visited by a social worker with a view to explaining the advantages of having unrecov-ered patients remain in the hospital when they are requesting dis-charge. Assistance is given to patients when it is for their benefit and they are visited in the wards and efforts made to see that they are furnished with magazines, books, tobacco, etc.

It seems that during the past year there were an unusual number of cases where emotionally upset patients had received distressing letters from people at home. Efforts in every case were made to contact

some local representative of the Red Cross, or others, to visit these homes in an attempt to relieve the condition at home, and in this manner relieve the unpleasant contact with patients. The psychiatric case work staff has continued filing pensions and the referring of other types of claims to the proper authorities for action. During the past year Red Cross representatives participated in the handling of 332 Government claims.

Tickets of all classes amounting to 3,428 were donated for the use of patients, 100 more than during the previous year. These tickets covered the Coast Guard and Marine football games, the American League baseball games, and the weekly shows at the Earle Theater. During the year there were 90 moving-picture shows in Hitchcock Hall on the hospital reservation. The Red Cross has supervised and arranged 171 general parties and entertainments, exclusive of dances and band concerts on the lawn. They have supervised and arranged 198 ward events, including occasional moving picture shows in Howard Hall and retreat wards. The athletic director has organized, supervised, and participated in 76 athletic events. The Red Cross House is kept open every day in the year. On Sundays and holidays it is open from 10 o'clock in the morning until 8 o'clock in the evening. The daily population visiting this house ranges from 750 to 800 patients.

Patients' library.—The total number of volumes in the patients' library is now 15,800. Seven hundred and fifty books were bound and repaired. Six newspapers (daily and Sunday) are subscribed for, as well as 19 popular magazines. Five thousand five hundred magazines, mostly surplus received from the Library of Congress, were distributed to the wards. Approximately 150 books were issued daily, and the number in constant circulation was about 3,500. The number of patients interested in the library work varied from time to time, the maximum number being about 25 patients employed in various capacities in the library and in the bindery.

MEDICAL DEPARTMENT

Social-service department.—The work of this department during the past year included training of students from the hospital training school and from the social-service school.

The social-service report from July 1, 1932, to June 30, 1933, showed the following:

Number of out-patients on rolls July 1, 1932.....	167
Number of out-patients on rolls June 30, 1933.....	149
Average number on rolls per month.....	160
Number of patients discharged from the hospital.....	80
Number of out-patients under care during the year.....	238
Interviews at the hospital pertaining to this work.....	647
Number of visits made in regard to this work.....	2,789

Training school.—Forty-two students graduated in the nurse and psychiatric-aide class during the year—20 graduates from the nurse class and 22 from the psychiatric-aide class. This was the largest graduating class in the history of the hospital's training school. The total number of students on the rolls July 1, 1932, in the senior class was 32, 3 of whom separated from the service, leaving a senior class of 29 who graduated. The junior class consisted of 32, of whom 10 were separated due to various causes, leaving 22 enrolled at the end of the year. On September 1, 1932, 39 students were admitted to the freshman class, of whom 18 were separated from the hospital, leaving 21 in this class. On July 1, 1932, there were 17 affiliate students and 8 postgraduates enrolled in the hospital. There have been 71 postgraduates enrolled since that period. Fifty-seven separated or completed their enrollment, leaving 38 on the rolls. Since July 1, 1932, 103 affiliates have been enrolled, 80 of whom completed the course, 2 were transferred back to their home schools, and 21 remained on the rolls. Thirty attendants began class work October 1, completing the course March 31. Twenty-three employees enrolled for the course given psychiatric aides and 22 are still enrolled. It has been decided not to admit a class in the fall of 1933.

Medical and surgical wards.—During the past year there have been admitted to the service 1,881 cases. Of these 1,611 were admitted to the medical and surgical wards, 252 to R Building, and 18 to Isolation Building. There were admitted to the various dispensary activities of the service 16,450 patients, who received 35,215 treatments.

During the year the use of quartan malaria was added to that of benign tertian malaria in the treatment of paresis. The quartan malaria seems to possess the advantage of a greater percentage of takes, a more persistent continuation of the paroxysms, and more consistently high temperatures and is more successful with the colored patients who are so frequently immune to inoculation with the colored strain. Furthermore, it has been easier to carry the strain along. The strain was obtained early in the fall and is still available. The attacks of malaria produced by the quartan parasite are just as easily controlled as those produced by the tertian type.

During the year the medical and surgical service received an inspection by the director of the hospital section of the American College of Surgeons and his assistant. As a result of this inspection the medical and surgical service was awarded the approval of the College of Surgeons and a certificate of that approval now hangs in the lobby of the medical and surgical building. One of the features instituted in the service in connection with the American College of Surgeons, requirements is a weekly clinical meeting of the staff at which cases are presented by the internes. This meeting occurs every Saturday morning. Generally two cases are presented. They are

thoroughly worked up beforehand and presented concisely and briefly in all their aspects. Following this presentation the cases are discussed by various members of the staff, criticisms being made and constructive suggestions offered. These meetings have proved to be very desirable stimulants to the internes' initiative and activity. These meetings are attended by the entire medical and dental personnel of the service and visits have been made by other members of the staff and by some outside practicing physicians.

Basal metabolism tests have been added to the routine admission procedures in cases of functional psychoses, and use of the sedimentation test has been discontinued. The Oaks hydrotherapy department gave 35,099 treatments during the year. In the C hydrotherapy room there were 34,218 treatments for the year, a total treatment average of 69,317 in the women's department. Occupational therapy classes are held in Toner and L Buildings all day, and in K and J Buildings half days. Classes are held in C and Q Buildings all day, and half days in M and N Buildings.

Psychotherapy.—A monthly average of 17 selected patients were afforded psychotherapy. With a few exceptions all admission conferences on the male services have been conducted by the clinical psychiatrist, who has tried, in addition, as far as possible to utilize the material for the instruction of attending internes. The admission conferences on the female services have been attended regularly and have been occasionally conducted by the clinical psychiatrist. Psychometric tests and personality studies have been made, numbering 146. Special mental examinations for psychiatric opinions have numbered 312. Hours of consultation on cases from other Government departments referred to the clinical psychiatrist numbered 56.

Laboratory.—The work of the laboratory has increased in nearly all respects, chiefly through greater diversification. This is particularly notable in the department of chemistry, including electrocardiography. The feature of training the internes in laboratory work has increased their efficiency in intelligently requesting examinations. Major changes in the set-up of the laboratory consist in enlargement of the chemistry department and the transformation of the old X-ray department into an excellent serologic laboratory. The doctor in charge of the chemistry department resigned in order to take a place in the Department of Biochemistry at Duke University. The work of the individual departments is summarized as follows:

Pathology.—Each Tuesday clinicopathologic conferences are held upon the cases coming to necropsy during the preceding week. At this time the diseased organs are demonstrated, and microscopic sections are presented by means of a projector. This conference is attended by the medical and surgical staffs, and is considered of

much value. The autopsy percentage has been maintained at a high level by the efficiency and interest of the medical staff. One hundred and ninety-two autopsies have been performed, the largest number since 1925.

Neurology.—Neurologic examinations are now established as part of the laboratory procedure, all new admissions with positive serology, all over 60 years of age, and all with suspected organic disease of the brain being submitted. The internes have worked diligently and effectively at this phase of the service.

Serology.—The study of colloidal gold promises to be an outstanding contribution from this laboratory. The progressive improvement of the gold reaction in treated paretics has been studiously observed over the past several years, and its prognostic value is considered notable.

Research.—Continuation of the work on catatonic patients is reported. Some very striking phenomena have been observed and occasional improvements are lasting. During the past year a grant from the Josiah Macy, Jr., Foundation to the Department of Neurology, George Washington University, has made possible a statistical study of the biometrical material that has been collected during the past 9 years at St. Elizabeths Hospital. This work has been done in conjunction with the department of biology, Johns Hopkins University. Owing to financial stringency the continuation of this work has been interrupted, but significant data upon the endocrine glands in relation to the psychoses are expected to be forthcoming.

NEEDS OF THE HOSPITAL

An estimate of \$1,182,600 for the support, clothing, and treatment of the patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1935, was recommended. This amount was based on 1,800 patients. The hospital at the present time has 4,981 patients. The average for the fiscal year 1933 was 5,036, as compared with 4,798 the previous year, an increase of 238. The average for the fiscal year 1935, it is estimated, will be 5,418, which will be 437 more than the present number. The 5,418 are divided as follows: 1,800 Federal patients, appropriated under the title of St. Elizabeths Hospital in the Interior appropriation act; 3,200 beneficiaries of the District of Columbia, and appropriated for in the District of Columbia appropriation act; 160 beneficiaries of the United States Veterans' Administration, and carried in its appropriation; 122 beneficiaries of the United States Public Health Service, and provided for in the appropriation for Treasury Department, under Public Health Service; 36 beneficiaries of United States Soldiers' Home, and payment for these to be received from that service. There is a new item of 100 estimated to be received from the Indian hospital and from

Indian reservations, and which will be chargeable to Bureau of Indian Affairs (conservation of health among Indians).

Legislation has so changed the conditions under which patients are committed to St. Elizabeths Hospital and the manner in which some of its funds are received that it is difficult to use precedents as a basis of the future needs. The act of March 20, 1933, practically repealed all laws governing the admission of service patients to St. Elizabeths Hospital, and the payments of funds due in the way of compensation, pension, etc., to the inmates of the hospital. This not only may affect the number of admissions, but it resulted in the transfer of a number of the beneficiaries of the United States Veterans' Administration from St. Elizabeths Hospital to hospitals and institutions of the Veterans' Administration. Similar action has been taken in reference to hospitals of the Army and Navy, and by transferring patients from those hospitals to Veterans' Administration hospitals left vacant beds in such hospitals, some of which may be filled by retaining mental cases which otherwise would be sent to St. Elizabeths Hospital.

The changing of the method of sending funds to the hospital affects, particularly, such funds commonly known as "pension moneys" received by the Superintendent under the acts of February 20, 1905, and February 2, 1909. Under the said acts all pensions of inmates of St. Elizabeths Hospital were sent to the hospital in the name of the Superintendent, who deposited the same directly, or through the disbursing officer of the hospital, in the Treasury of the United States under the account of Pension Money, Trust Funds. Accounts were opened with each patient, one sixth of all money being placed to his benefit on the books for his sole use. Of the balance a certain part would go to any dependent relatives, and if after paying their share any further balance remained would be used for reimbursing the hospital for any expenditure for the care and maintenance of the patient. In case of no dependent relative, the balance, after deducting one sixth, would be used to reimburse the hospital for the payment of care and maintenance. Should any moneys received for such pensioners be from the class that could be considered beneficiaries of the United States Soldiers' Home or indigents of the District of Columbia, those sources would receive credit for the accounts received from the individuals from their pensions when rendering monthly board bills. Thus this change in law will affect to some extent the amount to be paid to the hospital by the District of Columbia and the United States Soldiers' Home.

The hospital authorized for the Prison Bureau of the Department of Justice, at Springfield, Mo., has just been completed, and St. Elizabeths Hospital has been notified that the Department of Justice would remove about 31 patients and transfer them to its hospital at

Springfield. This will result in some reduction in the number of patients in the hospital. On the other hand, the hospital has been advised by the Commissioner of Indian Affairs that the Secretary of the Interior has ordered the transfer of approximately 100 Indians from the Canton Asylum for Indians at Canton, S.Dak., to St. Elizabeths Hospital. The hospital at Canton, S.Dak., will be closed and the Indians—who are wards of the United States Government—who hereafter will require mental treatment will be sent to St. Elizabeths Hospital for such treatment. If the Commissioner should complete this transfer, arrangements would have to be made for taking care of 100 additional patients, probably to be chargeable to the appropriation of the Indian Bureau.

The rate estimated for the care of patients during 1935 is \$1.80 per capita per day. This includes the basic salary without the 15 percent deduction at present in effect, and a slight increase on account of higher prices. At the present time the rates of food supplies, forage, textiles, etc., seem to be on the up grade. The effect of the N.R.A. action in providing codes for all industries seems to have a tendency to increase the cost of various items, and part of the estimated increase will be required for this purpose.

Included in the estimate is \$200,000 that is essential to keep up the repairs and necessary improvements to buildings and grounds. This is the same amount as authorized for 1933 and 1934. Out of these repairs will come the funds for keeping approximately 100 buildings in repair, repairing and widening some of the roads, the maintenance of the railroad track, various outbuildings, etc.

REVISION OF LAWS FOR ADMISSION OF PATIENTS TO ST. ELIZABETHS HOSPITAL

A bill was introduced in the House of Representatives and in the Senate of the United States to change the method of admissions to St. Elizabeths Hospital. The main changes from the existing legislation were:

Provision for voluntary commitment for treatment, on request of patients, with provision for discharge on 3 days' notice. Provision that insane persons taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital and treated, and not tried except upon their requests or requests of their relatives, guardians, or friends. If a trial is demanded by an insane person, his guardian, or friends, or by court, upon petition, the insane person shall be heard by the court, and not subjected to trial by jury unless the insane person, his relatives, guardian, or friends demand it.

Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the

District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital where the patient may be detained, that the person is not insane or has recovered his or her reason.

Provision for the automatic restoration of the civil rights of patients discharged from the hospital on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

The proposed legislation recommended, it is believed, would for the most part make unnecessary writs of habeas corpus and would make the release of patients to those competent to care for them simpler, and it would be in keeping with previous attempts to secure legislation amendatory of those portions of the District Code which deal with the admission, detention, and release of patients in the Government Hospital for the Insane (St. Elizabeths Hospital).

In the report of the Comptroller General of the United States (H.Doc. 605, 69th Cong., 2d sess.), suggestion is made that additional legislation on this subject is desirable.

A committee of medical advisers which made a survey of the hospital under the direction of the Secretary of the Interior made a number of recommendations for remedial legislation, but did not undertake to draft a measure for this purpose. The design of the bill suggested was to provide a method more in keeping with the modern humanitarian and medical attitude toward this class of patients, and along lines which have proved effective in several of the States and in other countries. Provision for emergency commitment is included. Authority is given the superintendent to consider paroling of patients as a therapeutic measure, and to permit the return of patients to their homes under the supervision of the hospital.

There was a hearing before a subcommittee of the District of Columbia Committee of the House of Representatives during a previous year. There were present at this hearing representatives of the hospital and a representative of the corporation counsel of the District of Columbia in favor of the bill, and two parties, a man and a woman, opposed to it.

As a result of this hearing we are more than ever of the opinion that the laws pertaining to the admission and treatment of the patients at St. Elizabeths Hospital should be revised, but we believe that the initiative should be taken by representatives of the District Government; and the Interior Department, through representatives of the hospital, should cooperate with the District authorities in securing the enactment of the proposed bill into a law. The District is primarily interested in such legislation, as it affects the welfare of its residents, and we believe if the initiative is taken by them heartier cooperation would result and the bill perhaps would receive better consideration.

HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, S.T.M., D.D., President)

The year 1932-33 was the second of the 10 years involved in the program of development approved by the Government. During this year the university suffered heavily from the depression. Enrollment fell 571 below 1931-32. The university also suffered loss in income from the Government and from private sources. Heavy curtailments of planned expenditures were made in materials and supplies and in educational and scientific equipment. Teachers' salaries were reduced. At length, also, reductions in teaching personnel became imperative. In spite of the difficulties, however, the budget was kept at balance, with a surplus accruing at the end of the year, and the percentage relation between Government and private funds was maintained at the balance provided for in the agreed-upon program of development.

The university continued to receive help from the General Education Board and the Julius Rosenwald Fund for the development of the libraries, the further improvement of the teaching staff through fellowships, for research in zoology, for the extension of university grounds, and for teachers' salaries, although most of the latter could not be used on account of loss in the supporting structure of current funds.

The teaching staff of the university, strengthened by 3 years of farsighted Government help, was numerically adequate for the student body for the first time since the university abolished its secondary division in 1919, although this adequacy was not equally distributed throughout the university and the number of mature teachers in the professorial rank was still less than half the number required for an adequate teaching staff. The teachers continued their eager self-improvement, fully one eighth of the entire full-time number being away on leave for further study during the year.

The area of research was expanded, especially in the biological sciences, and scholarly publications continued. The Journal of Negro Education, established 1 year ago, was widely welcomed as an educational organ of national significance.

Though current funds were reduced, there was substantial improvement in educational and scientific equipment and in the libraries. Through the use of emergency construction funds, made available by the Government, the entire south end of the main university campus was graded for use as a science quadrangle, terraced, sodded, finished, and otherwise beautified. The heat, light, and power tunnel, pro-

vided by the Government, was also completed. Plans for the chemistry and classroom buildings were finished and substantial progress had been made on the plans for the library and the heat, light, and power plant.

Important actions were taken by the board of trustees looking toward the improvement of the university. Trustee bylaws were revised and simplified. Trustee committees were limited in number and their functions redefined. The university financial system was thoroughly surveyed by experts in educational finance. The offices of secretary and treasurer, hitherto united in the office of secretary-treasurer, were separated. Publications, publicity, and promotion were merged with the secretarial duties of the board of trustees and of the university, in one office, while a new treasurer was elected and all financial and business administration was concentrated in his office. The accounting system was reorganized on the basis agreed upon by the American Association of Universities and the American Association of Colleges.

The educational organization of the university was thoroughly surveyed by experts from Columbia University and a consequent simplification of organization was voted by the trustees on the basis of this and other studies as follows: All undergraduate studies to be combined in one undergraduate college of liberal arts, beginning 1933-34; a graduate school to be organized in 1934-35, with a separate dean; engineering branches and architecture to be discontinued at the end of 1933-34 and committees appointed to study the adjustment of other applied-science divisions, education and music, to the undergraduate and graduate units; the position of university architect to be discontinued at June 30, 1933, and architectural services to be related to future buildings as and when appropriations are made; the semester system to be established throughout the university 1933-34; the summer school to be discontinued; the theological college, evening school, and correspondence courses in religion to be discontinued, and the school of religion established on a graduate basis beginning 1933-34.

During the year three needs of the university emerged as primary and urgent. First, the need for advancing the maturity of the teaching staff by increasing the number of competent teachers in the professorial rank. Secondly, the need for a library building, with an enlarged staff and a substantial increase in the number of books. Thirdly, the urgent need for large increases in the amount of money available for student scholarships and fellowships.

REGISTRATION

The following table shows the net total enrollment at Howard University during the school year 1932-33, including summer, autumn, winter, and spring quarters, and excluding duplicates, as compared with 1931-32.

Summary of students enrolled in Howard University for the years 1932-33 and 1931-32

Divisions of the university	Net enrollments						Total gain	Total loss		
	1932-33			1931-32						
	Total	Men	Women	Total	Men	Women				
<i>The colleges</i>										
College of liberal arts-----	540	375	165	678	480	198		138		
College of education-----	523	113	410	746	163	583		223		
College of applied science-----	77	50	27	68	35	33	9	-----		
School of music-----	41	16	25	61	22	39		20		
Graduate division-----	170	83	87	194	80	114		24		
Total-----	1,351	637	714	1,747	780	967	9	405		
<i>Professional schools</i>										
Theological college-----	40	32	8	39	33	6	1	-----		
Graduate school of theology-----	10	10		5	5		5	-----		
Law school-----	44	44		61	61			17		
School of medicine:										
College of medicine-----	206	200	6	221	215	6		15		
College of dentistry-----	38	37	1	52	49	3		14		
College of pharmacy-----	24	22	2	33	28	5		9		
Total in professional schools-----	362	345	17	411	391	20	6	55		
Total in regular courses-----	1,713	982	731	2,158	1,171	987	15	460		
Special students in music, religion, law, dentistry-----	96	30	66	24	12	12	72	-----		
Correspondence students, religion-----	84	82	2	282	281	1		198		
Total special students-----	180	112	68	306	293	13	72	198		
Grand total (net)-----	1,893	1,094	799	2,464	1,464	1,000	87	¹ 658		

¹ Net loss 571.

This table shows that the total enrollment for 1932-33 was 1,893 students, of whom 1,094 were men and 799 were women, as compared with the total of 2,464 for 1931-32, of whom 1,464 were men and 1,000 were women. A net loss of 571 students, or 23 percent, is indicated. The heaviest losses (372) are indicated in the undergraduate divisions, where the college of education led with a total loss of 223, or 30 percent. The degree students of applied science, however, proved an exception, showing a gain of 9.

The graduate division showed a loss for the first time since its organization, though the total percentage of loss in this division (12 percent) was little more than half the prevailing percentage of loss in the university as a whole. The professional school showed a loss of 49 students, or only 12 percent. In medicine, the losses were slight in number and percentage, while the theological college and the graduate school of religion registered gains of 1 and 5, respectively.

When it is considered that Negro students and their parents constitute the poorest tenth of the American population, being the first to suffer from depression and generally the last to recover, this decline in enrollment at Howard University must be considered remarkably small.

There is ample evidence, however, that many students are remaining in school under the severest strain. The university is making every possible effort to help students by increasing the number of small scholarship grants and work opportunities, awarded on the basis of high scholastic standing accompanied by manifest need. Resources for such relief, however, are painfully limited. There is no possibility of rendering help to more than a small percentage of even the most deserving.

Geographical distribution.—Forty States sent 1,590 candidates for degrees to Howard University in 1932-33 as compared with 42 States sending 2,015 candidates for degrees in 1931-32. It is to be said that 25 States sent 10 or more candidates for degrees to the university during both these years. Seventeen foreign countries sent 123 candidates for degrees to Howard University during the school year 1932-33 as compared with 16 foreign countries with a total of 143 candidates for degrees in 1931-32.

GRADUATES

In 1932-33, a total of 319 students were graduated, as compared with 361 in 1931-32, a decrease of 42. The divisions of liberal arts, education, law, and medicine shared these losses. Increases in the number of graduates are shown in the college of applied science, the school of music, the graduate division, the theological school, the college of dentistry, and the college of pharmacy.

Summary of students graduated by Howard University for the years 1932-33 and 1931-32

Divisions of the university	Graduates						Total gain	Total loss		
	1932-33			1931-32						
	Total	Men	Women	Total	Men	Women				
<i>The colleges</i>										
College of liberal arts.....	64	44	20	96	75	21	-----	31		
College of education.....	122	25	97	131	22	109	-----	11		
College of applied science.....	7	3	4	6	5	1	2	-----		
School of music.....	4	1	3	3	0	3	1	-----		
Graduate division.....	34	17	17	18	11	7	16	-----		
Total.....	231	90	141	254	113	141	19	42		
<i>Professional schools</i>										
Theological college.....	10	6	4	8	8	-----	2	-----		
Graduate school of theology.....	-----	-----	-----	-----	-----	-----	-----	-----		
Law school.....	8	8	-----	18	18	-----	-----	10		
School of medicine:	-----	-----	-----	-----	-----	-----	-----	-----		
College of medicine.....	42	42	-----	55	53	2	-----	13		
College of dentistry.....	18	17	1	17	17	0	1	-----		
College of pharmacy.....	10	9	1	9	6	3	1	-----		
Total in professional schools.....	88	82	6	107	102	5	4	23		
Grand total (net).....	319	172	147	361	215	146	23	1 ⁶⁵		

¹ Net loss, 42.

Of the 34 who received degrees from the graduate division, 23 were awarded the degree of master of arts, while 11 received the degree of master of science.

Of the 64 graduates in liberal arts, 41 received the degree of bachelor of arts, 19 the degree of bachelor of science, and 4 the degree of bachelor of science in commerce. Of the 122 graduates in the college of education, 96 received the degree of bachelor of arts in education and 26 the degree of bachelor of science in education. Of the 7 graduates in applied science, 1 received the degree of bachelor of science in architecture, 1 in civil engineering, 1 the degree of bachelor of science in electrical engineering, and 4 the degree of bachelor of science in home economics. Four graduates received the degree of bachelor of music.

In the professional schools, 42 graduates received the degree of doctor of medicine and 18 the degree of doctor of dental surgery. Of the 10 who received degrees in pharmacy, 3 received the degree of bachelor of science in pharmacy and 7 the degree of pharmaceutical chemist. In the school of law, 8 degrees of bachelor of laws were awarded.

Honorary degrees.—One honorary degree of doctor of laws was conferred, the recipient being Oswald Garrison Villard, editor of *The Nation*.

TEACHING STAFF

1. *Number of teachers.*—There were 265 members on the teaching staff during the year 1932-33, of whom 153 were on full time and 122 were on part time, representing together a full-time equivalent of 174½ teachers. This represents a reduction of 16 in the faculty as compared with 1931-32, made necessary by decreasing enrollments and reduced financial income. These reductions were distributed over the following colleges: Liberal arts, education, applied science, music, law, and dentistry.

2. *Teaching hours, class size, and class-hour loads.*—In the professional schools and colleges there were no marked changes in hours of teaching with the exception of the preclinical branches of medicine where teaching hours were increased on account of the necessary subdivision of classes.

By reason of the decreased enrollment in dentistry, pharmacy, and law, class sizes showed a reduction for the professional group, with a corresponding increase in the number of teachers carrying clock-hour loads below 300.

In the undergraduate and graduate divisions where loss in enrollment was accompanied by reduction in the number of teachers, there was a shift of 14 teachers from the groups rendering 1 to 15 hours of service per week to the groups rendering from 16 to 30 hours of service per week. Class size, however, showed a decided shift from

the group of classes ranging from 16 to 50 students in number toward the groups ranging from 1 to 15 in number. Clock-hour loads ranging from 1 to 200 showed a gain of only 5, however. The loss of 13 teachers from the groups ranging from 201 to 500 clock hours was due, in part, to the reductions in staff made by the board of trustees.

3. *Improvement of staff.*—The teachers continued their work of self-improvement through further study. During the year, 25 of them continued study at other universities. Twenty-two of this number were on leave of absence for the purpose. Four of these earned the doctor's degree and returned to the staff. There were 6 important appointments, which strengthened the intellectual standing and maturity of the staff.

Of the 22 teachers on leave of absence and on scholarships for further study, 12 were from the college of liberal arts, 2 from education, 3 from applied science, 1 from music, 2 from law, and 2 from medicine. The university is deeply indebted to the Rockefeller Foundation and the General Education Board for funds which have made much of this study possible, and to the Julius Rosenwald Fund for annual assistance.

4. *Maturity of the staff.*—While during the current year it became apparent that the faculty of Howard University was for the first time numerically adequate for the student body, it was all the more clear that by reason of the limited number of teachers in the professorial rank this staff had not yet passed the half-way mark toward maturity. Of the 175 teachers (exactly 174½ full time and full-time equivalent) at Howard University during the school year 1932-33, only 34, or 19 percent, were in the professorial rank; 26, or 15 percent, were in the associate professorial rank; 33, or 19 percent, in the assistant professorial rank; while 82, or 47 percent, were in the instructors' rank and below. On the basis of the 10-year program of development which calls for a percentage distribution in the four leading ranks of 40%-10%-20%-30%, the present staff (full time and full-time equivalent) should have a distribution as follows: 70 professors, 17½ associate professors, 35 assistant professors, 52½ instructors. On the quantitative basis alone it appears that the university has yet more than half way to go in the development of an able staff of mature professors. An examination of university salaries confirms this judgment. The university is spending approximately \$175,000 less in salaries than would be necessary to obtain and hold the services of a sufficient number of mature professors at the salary scale planned in the 10-year program. The securing of 36 mature capable scholars for important positions on the professorial staff of the university is the outstanding educational need. All other improvements are subsidiary to and wait upon this for their fullest effectiveness.

5. *Salaries of teachers.*—The salaries of the teaching force, administrative staff, and employees of the university during the school year 1932-33 were cut by percentages of 8% and 6% successively. This was an especially hard burden for the teachers to bear, for in all of the four ranks of instruction the average salary, before the cuts were made, was still far below the normal average set forth in the 10-year program of development. The university is mindful of the fact that prompt curtailment in the number of teachers on educational and financial grounds increases all the more the obligation to afford adequate salaries for those who remain on the staff. With the return of normal conditions, it is the purpose of the trustees to move toward the averages set up in the 10-year program as swiftly as the resources of the university will permit.

GRADUATE DIVISION

1. *Student enrollment.*—During the year 1932-33, there were 170 graduates in residence in Howard University, including 83 men and 87 women, 141 of whom were registered as pursuing graduate degrees in 18 departments, as shown in table 6. The registrants for advanced degrees showed a decrease of 16 as compared with the school year 1931-32, but the percentage reduction of 13 was much less than the general decrease in student attendance throughout the entire university (about 23 percent). In spite of this decrease in enrollment, incident to distressing economic conditions, the total enrollment of 141 was 1 student in excess of the enrollment of 140 planned in the 10-year program for the graduate division during the year 1932-33.

2. *Degrees awarded.*—The number of students who received advanced degrees in 1932-33 was 34, as compared with 18 in 1931-32 and 13 in the year 1929-30, the highest preceding peak years. Of the 34 graduate degrees awarded, 23 were masters of arts, awarded to 9 men and 14 women, and 11 were masters of science, awarded to 7 men and 4 women. Ten of the degrees were awarded in education, 4 in French, 6 in English, 3 in history, 3 in mathematics, 2 in chemistry, 3 in psychology, 1 in physics, and 2 in zoology.

3. *Teaching staff.*—The teaching staff of the graduate division during 1932-33 included 48 members as compared with 49 in the year 1931-32. Of this number, 39 were from the faculty of the college of liberal arts, 7 from the faculty of education, and 2 from the faculty of the school of religion.

4. *Research and publication.*—With the aid of the Julius Rosenwald fund, research in zoology was continued, this being the last of 5 years, under the grant of \$15,000 for the purpose. Grants to Associate Professor Harris and Assistant Professor Lewis, in the depart-

ment of economics, enabled them to continue their projects in this field. Three members of the college of education engaged in four research projects. Four members of the faculty of medicine engaged in significant research. One member of the faculty of dentistry undertook research in pathology.

During the school year members of the university teaching staff published 57 scholarly articles and 2 books.

5. *Future of graduate work.*—The 6-year experiment with a graduate division at Howard University, under the control of a committee of instruction appointed by the president from the several faculties of the university, has proved that the project to develop graduate work at the university is soundly based on a real and growing need. Enrollment has steadily increased and in spite of the depression, has passed the point of growth planned for normal years. The number of degrees has increased from 3 to 34.

Increased resources of the university have made available a steadily advancing number of competent teachers with time available for careful attention to the individual student and to the pursuit of independent reflection and research. At the end of the school year 1933-34, the experimental period will end and the university will formally organize a graduate school under a separate dean. This forward step was provided by the unanimous passage of the following recommendation by the board of trustees at their meeting on April 28, 1933:

That all graduate study be offered in a graduate school beginning with the year 1934-35, and that this school have an organization and administration analogous to that of the other separate schools and colleges of the university and with a dean at its head.

COLLEGE OF LIBERAL ARTS

General trends.—The outstanding development in connection with the college of liberal arts during the current year was the action of the board of trustees under date of April 28, 1933, combining all the departments of undergraduate study in the college of liberal arts at the end of the next academic year (1933-34). As a result of the continuing economic depression, the enrollment of the college declined by 138, or 20.4 percent, entailing drastic reductions in every item of the budget, including teachers' salaries; the loss of secretarial, administrative, clerical and technical assistants; and the placing of others on half time, during the year.

Inasmuch as this loss was accompanied by a decrease of 223 students, or 30 percent, in the college of education, the trustees were obliged at the close of the year to reduce the faculty of the college of liberal arts by 22 members, to discontinue 2 fellows and an educa-

tional caretaker, and to place 1 other teacher on half time. These changes were worked out in the closest cooperation with the faculty, however, the members of which maintained excellent esprit de corps under the difficult circumstances.

Student enrollment.—The enrollment of students in the several departments is shown in the following table and is based on the average quarterly registration of students for autumn, winter, and spring of the school years 1931-32 and 1932-33. The table shows that every major department in the college experienced a loss of students during the year. The net enrollment of 540 is 110 below the planned enrollment of the college of liberal arts for the normal conditions expected in the 10-year program.

Enrollments in the college of liberal arts by departments

Departments	Number of students		Gain	Loss
	1931-32	1932-33		
Military training—men	257	232		25
Physical education—men	246	163		83
Physical education—women	276	219		57
Freshman orientation		46	46	
English	530	438		92
Mathematics	102	97		5
Botany	65	54		11
Chemistry	205	179		26
Physics	77	61		16
Zoology	101	74		27
German	104	103		1
Latin	21	12		9
Romance languages	263	172		91
Greek		6	6	
Commerce	83	70		13
Economics	98	34		64
History	288	227		61
Political science	113	71		42
Sociology	124	120		4
Philosophy	58	45		13
Psychology	207	196		11

Graduates.—The college of liberal arts awarded 64 degrees in the year 1932-33. This indicates a net loss of 32 graduates over the number for the preceding year. Of the 64 graduates, 41 received the degree of bachelor of arts, 19 the degree of bachelor of science, and 4 the degree of bachelor of science in commerce. Forty-four of the graduates were men and 20 were women.

Teaching staff.—The following table shows the teaching staff of the college of liberal arts for 1932-33 as compared with the staff for 1931-32. A net loss of 11 teachers is indicated. Five teachers returned from leave of absence, 3 of them with the doctor of philosophy degree. There are now 26 members of this faculty who hold the degree of doctor of philosophy.

Teaching staff of the college of liberal arts

Rank	Year		Gain	Loss
	1931-32	1932-33		
Professors.....	20	17		3
Associate professors.....	13	13		
Assistant professors.....	23	17		6
Instructors.....	32	27		5
Assistants.....	6	9	3	
Total.....	94	83 ¹	3	14
Net loss.....				11

¹ This number was reduced by 22 on June 30, 1933.

Twelve members of the faculty were on leave of absence during the year for the purpose of carrying on graduate studies. At the April meeting of the board of trustees, in view of the decreasing enrollment of this college and the college of education, the services of 22 members of this faculty were terminated and 1 other member was placed on half time.

One of the most painful elements in the loss of teaching service was the temporary discontinuance of native teachers of high qualification in the department of German and romance languages. It is the purpose of the administration to reappoint such teachers at the earliest possible opportunity.

THE COLLEGE OF EDUCATION

General trends.—The most significant development in connection with this college during the year was the vote of the board of trustees that all departments of undergraduate study be combined in the college of liberal arts at the end of the next academic year (1933-34). This vote of the board is not interpreted to mean any lessening of interest in the preparation of teachers, as it was accompanied by a further vote of the board providing that the courses in education be so reorganized that there shall be offered in the college of liberal arts and in the form of undergraduate majors sufficient courses and of a character to afford adequate concentration to prepare for graduate or professional study in this field.

Student enrollment.—The enrollment in the college of education declined from 746 in 1931-32 to 523 in 1932-33, a loss of approximately 30 percent. This decrease is a continuation of the drop which began in 1930-31 after the peak in enrollment of 919 in the year 1929-30. This decline can be ascribed primarily to the general economic situation, the published reports of an oversupply of teachers, together with the manifest difficulties attending the teaching profession during the depression and the increased competition from colleges where the costs are less.

The following table exhibits the enrollment in the college of education, undergraduate and graduate, for a period of 7 years, beginning 1926-27. The table also shows the growth in the number of full-time teachers.

Number of full-time teachers and undergraduate and graduate enrollment of the college of education for the period 1926-27 to 1932-33

Year	Full-time teachers	Undergraduate		Total students	Graduate
		Male	Female		
1926-27	2	144	508	652	0
1927-28	3	162	579	741	1
1928-29	4	193	643	836	2
1929-30	8	206	713	919	15
1930-31	11	175	633	808	25
1931-32	15	163	503	746	77
1932-33	14	113	410	523	51

¹ 1 on leave of absence.

² 2 on leave of absence.

Graduates.—In 1932-33 there were 122 graduates of the college of education. Ninety-six degrees of bachelor of arts and 26 degrees of bachelor of science in education were awarded. These figures show a decrease of 19 graduates under the number for the year 1931-32. In the graduate division 51 students were working for the master's degree in the field of education. Of 34 master's degrees granted, 10 were in the field of education.

Teaching staff.—There were 12 members of the faculty of education during the year 1932-33: Professors, 3; associate professors, 2; assistant professors, 2; instructors, 4; assistants, 1. The college was assisted by 10 other part-time teachers belonging to the faculties of liberal arts, applied science, and music. One member of the faculty resigned during the year to accept the leadership of the State side of Wilberforce University. Two teachers were on leave of absence for graduate study. The dean returned from a year's sabbatical leave during which he studied as a Rosenwald fellow at Columbia University. The members of the faculty published 20 scholarly articles during the year and carried the Journal of Negro Education through its first successful year. That this journal is meeting a real need in the literature of education is indicated by the comments received from both American and foreign educators.

At the end of the year three teachers were discontinued as part of the university's necessary financial retrenchment.

Student teaching.—During the current year, student teaching has been particularly satisfactory. Sixty-one student teachers did practice teaching in nine of the public schools of the District of Columbia and two in Howard University. These students practiced in a total of 15 different subjects as majors. The university is much indebted to the officers and teachers of the public-school system for their cordial cooperation in the matter of practice teaching.

COLLEGE OF APPLIED SCIENCE

Organization and curricula.—The college of applied science has customarily offered 6 curricula in 4 major departments as follows: Architecture, art, home economics, and engineering—including the curricula of civil, electrical, and mechanical engineering, and building construction. By vote of the board of trustees, the courses in electrical engineering, civil engineering, mechanical engineering, and architecture are to be dropped at the end of the next academic year, 1933-34, and the course in home economics is to be so reorganized that there shall be offered in the college of liberal arts and in the form of undergraduate majors sufficient courses and of a character to afford adequate concentration to prepare for graduate or professional study in this field.

Enrollment.—During the year 1932-33, 177 students enrolled in the classes of the college of applied science as compared with 180 for the previous year, representing a net loss of 3. The 77 students seeking degrees in applied science during the year 1932-33, however, represented an actual increase of 9 over the 68 candidates for degrees in 1931-32.

Teaching staff.—The faculty of the college of applied science included 15 full-time and 3 part-time members during the year 1932-33, distributed as follows: Professors, 0; associate professors, 3; assistant professors, 4; instructors (full time), 8; instructors (part time), 3. The members of the faculty were distributed among the departments as follows: Architecture—1 associate professor, 2 assistant professors, 1 instructor (full time), and 1 part-time instructor; art—1 associate professor, 4 instructors; engineering—1 associate professor, 1 assistant professor, 2 instructors; home economics—1 assistant professor, 1 instructor (full time), 2 instructors (part time).

Two members of the faculty were on leave of absence for further study. Three teachers received distinction during the school year 1932-33 as follows: 1 in local architectural competition and 2 in national art competitions. Two members of the faculty were released without prejudice at the end of the school year as part of the university's financial retrenchment program.

One associate professor in the department of architecture returned from 2 years of study and travel in the United States and in Europe, devoted primarily to the study of housing for workers with low income.

MUSIC

Organization.—As a consequence of their vote to establish a single undergraduate college beginning with the school year 1933-34, the trustees are to appoint a special committee to study and report upon the readjustment of the courses in music to the graduate and undergraduate schools.

Enrollment.—The average enrollment of students in the school of music per quarter during the school year 1932–33 was 118 as compared with 121 for the school year 1931–32. There was a total of 27 degree students, 10 men and 17 women, 24 less than the number enrolled in 1931–32. This decline in enrollment was undoubtedly due to the same factors as those operating in the college of liberal arts and education, plus the additional consideration that the fees in music are much higher.

Graduates.—In 1932–33, there were 4 students who were graduated with the degree of bachelor of music—2 in the department of piano and organ, and 2 in the department of voice. This is an increase of 1 over the number of graduates for 1931–32.

Teaching staff.—The faculty of the school of music for the school year 1932–33 included 10 members, as follows: Professors, 2; assistant professors, 2; instructors, 6. One member of the faculty returned from leave of absence during the year to resume instruction in piano and methods. Two members secured leave of absence for further study during the school year 1933–34.

MILITARY SCIENCE AND TACTICS

1. *Enrollment.*—The enrollment in military science and tactics during the year 1932–33 was as follows: Autumn quarter, 246; winter quarter, 231; spring quarter, 219; average for the year 232.

2. *Courses.*—The work is divided into two courses. The basic course, which is compulsory, and the advanced course of the juniors and seniors, which is elective.

3. *Commissions.*—Twenty-four students were awarded commissions as second lieutenants of infantry, Army of the United States.

4. *Teaching staff.*—The teaching staff of the department of military science and tactics includes 5 members as follows: Professors 1, assistant professors 1, assistants 3.

SUMMER SCHOOL

The summer school of 1932–33, continued for 6 weeks, registered 291 students from 26 States and 2 foreign countries, of whom 231 were women and 60 were men. These students were distributed as follows: College of education 170, college of liberal arts 60, college of applied science 9, school of music 4, graduate division 40, special students 8.

Forty-nine courses were offered by 26 teachers, all of whom were regular members of the faculty of the university.

At the end of the session there were 24 graduates: 13 from the college of education, 7 from the college of liberal arts, and 1 from the college of applied science.

Beginning with the school year 1933–34, by vote of the board of trustees, the summer school will be discontinued.

SCHOOL OF MEDICINE

The school of medicine is the entire medical unit of the university. It includes the colleges of medicine, dentistry, and pharmacy. Freedmen's Hospital, an independent institution built on grounds owned by the University, is functionally a part of the university medical unit.

THE COLLEGE OF MEDICINE

General trends.—Effort was concentrated upon continued improvement in the preclinical departments. Two full-time, well-trained teachers were added to the faculty—1 in anatomy, 1 in pediatrics. Improved facilities for instruction were provided in some of the smaller rooms and laboratories.

Many essential pieces of scientific apparatus and equipment were provided. Instruction was improved by dividing classes into two sections for laboratory work. The circulation of books and periodicals in the medical library for the year was 36,986; the number of readers was 57,474. These figures more than doubled over the previous year.

Enrollment.—In 1932-33, 206 students were enrolled in the college of medicine; of these, 6 were women. The depression had little effect upon the enrollment for the year. The losses were chiefly due to the dropping of poor students at the end of the previous year.

Graduates.—In June 1933, the degree of doctor of medicine was conferred upon 42 candidates as compared with 55 in 1932.

Internships.—All of the 42 graduates of this year's class have been appointed to internships approved by the council on medical education, licensure, and hospitals. Twenty-three of this number secured internships in the Freedmen's Hospital.

Faculty.—The faculty of the college of medicine in 1932-33 included a total of 102 teachers of all ranks, a decrease of 2 under the total of 104 for 1931-32. Of these 102 teachers 16 were on full time and 86 on part time, together representing a full-time equivalent of 28.9 teachers. During the year, 4 members of the staff engaged in significant research in anatomy, pharmacology, bio-chemistry, bacteriology, preventive medicine, and public health. Five scientific papers were published and seven others accepted for publication.

Hospital relations.—The relation of the college of medicine with the Freedmen's Hospital continues to be most cordial and to improve in functioning. The medical council of the hospital is now composed of the surgeon in chief of the hospital, the dean of the school of medicine, and the heads of the clinical departments. The heads of the pre-clinical departments in the school of medicine are members of the hospital staff. With one exception, every member of the hospital staff is a member of the university faculty. The new out-patient department of the hospital adds greatly to facilities for clinical teaching.

These facilities are still defective for teaching tuberculosis and acute contagious diseases. It is hoped that these needed teaching resources may be provided at some early date by additions to the Freedmen's Hospital.

COLLEGE OF DENTISTRY

General trends.—There is a manifest and urgent need for an increased number of dentists to serve the Negro population of the United States. The State of Mississippi, for example, with over a million Negro population has only 29 Negro dentists. In spite of this need, the attendance of Negro students in dental schools in the United States has not only not increased in recent years but has decreased steadily from 213 in 1928 to 86 at the present time. The faculty of dentistry recognizes the working of retarding factors here which were in existence before the depression came. They are undertaking to counteract these tendencies and to reestablish a normal stream of able students entering the profession of dentistry.

Further improvement has been made in the curriculum by expansion of the didactic course in orthodontia to include laboratory and clinical instruction. Oral pathology has been widened in scope to include a laboratory course.

Enrollment.—Thirty-eight students enrolled in the college of dentistry during 1932-33, one of whom was a graduate student who devoted the year to clinical operative dentistry. This number indicates a loss of 15 as compared with 1931-32. The freshman class, however, was short by only two. The greatest decrease has been due to failures.

Graduates.—Eighteen candidates were awarded the degree of doctor of dental surgery as compared with seventeen in 1931-32. Graduates of the college have shown steady improvement in the State board dental examination during recent years. This is undoubtedly an outgrowth of the recent reorganization of the college, the raising of its entrance requirements, and the general improvement of its curriculum and morale.

Teaching staff.—The teaching staff of the college of dentistry continued to include 14 members in 1932-33, 11 of whom were on full time and 4 on part time. The trustees postponed possible reductions in this faculty until 1933-34, after further study. One member of the staff pursued graduate study during the year and the dean was awarded the degree of master of science in dentistry by Northwestern University for research in dental pathology.

Further improvement.—The college of dentistry stands in very great need of improvements in the physical plant to enable the faculty to make use of available space for educational laboratories and classroom.

COLLEGE OF PHARMACY

General trends.—Students registered for the first time in the 4-year course in pharmacy required by the American Association of Colleges of Pharmacy, of which this college is a member. The physical equipment of the college was greatly improved by the installation of new and modern laboratories for pharmacy and pharmaceutical chemistry, as well as research and preparation laboratories with necessary store rooms and offices. Important additions were made also to the scientific apparatus of the college.

Enrollment.—Twenty-three students registered in the college of pharmacy for all classes as compared with thirty-two during 1931-32.

Graduates.—There were 10 graduates in 1932-33 as compared with 13 for 1931-32. Seven students were graduated from the 3-year course leading to the degree of pharmaceutical chemist and 3 from the old 4-year course leading to the degree of bachelor of science in pharmacy.

Faculty.—The faculty still consists of 5 members, 4 of whom are on full time and 1 on part time, as follows: Professors 2 (full time), associate professors 1 (full time), instructors 2 (1 full time, 1 part time).

Future of the college.—In considering the reorganization of the university, the trustees were uncertain about the future of the college of pharmacy, postponing the question of its continuance until the October meeting, 1933.

SCHOOL OF LAW

Enrollment.—Student enrollment in law took a further drop from 63 in 1931-32 to 42 in 1932-33. There were no special students in the school. The decrease in enrollment, it is believed, was due wholly to the economic depression. Offsetting the decrease in enrollment is a decided improvement in the caliber of the student body. Of the 16 students entering the freshman class, 10 held degrees and 2 others had had 4 years of college training. The school is now in position to do more intensive and scholarly work.

Graduates.—Eight degrees were awarded for the year 1932-33 as compared with eighteen during the previous year. Eight of the thirteen graduates of the new day class of 1931 are in the active practice of law and 10 of the 14 graduates of 1932 are in active practice. These graduates are located in eight States and the District of Columbia.

Library and physical equipment.—The library of the school contains 14,411 volumes as of June 30, 1933, an increase of 563 volumes over 1932. The physical plant is outgrown and otherwise inadequate. The trustees have voted to move the school into the building on the main campus formerly devoted to a dining-room commons as soon as money is available for alterations.

Faculty.—The faculty of the school of law for 1932-33 included 10 members, 4 of whom were on full time and 6 on part time, distributed as follows: Professors 5 (2 full time, 3 part time), associate professors 1 (full time), assistant professors 2 (1 full time, 2 part time), lecturers 1 (part time).

SCHOOL OF RELIGION

The school of religion receives no aid from Government appropriations. It is entirely supported from a small endowment and from private gifts. The dean reports that the year 1932-33 was in some respects the best of several years.

Students.—The total number of students in the school of religion was 64, an increase of 13 over last year. This was the largest enrollment in many years. Of this number 16 were enrolled in the graduate department and 48 in the theological college. The evening classes were conducted, as usual, with a registration of 16 students. The extension department was also maintained, giving aid by correspondence to more than 100 persons, mostly pastors. Only one extension institute was held during the year, largely because the schools at Fayetteville and Sedalia, N.C., were unable to finance their part of the program, as they had formerly done. Class work was reported satisfactory and the students were enthusiastic over their studies, but the strain of meeting their economic problems was very severe.

Faculty.—There was one death on the faculty. Two full-time members were added. Total faculty for the year: 11—4 on full time, and 7 on part time. Together these faculty members represented a full-time equivalent of 6½ teachers. The school needs a minimum of 8 full-time teachers to continue its graduate division alone.

Organization and curricula.—For many years this school has conducted five divisions of work: Graduate, theological college, evening school, correspondence, and extension institutes. Beginning with the school year 1933-34, by vote of the board of trustees, the correspondence, evening school, and theological college courses will be discontinued, and the school of religion will thereafter proceed solely as a graduate school.

PERSONNEL

The registrar.—The registrar of the university conducts all of the correspondence incident to the appraisal of the scholastic standing of all students desiring to enter Howard University and issues cards of admission when it has been determined that students have met the entrance requirements of the school or college concerned. He keeps an accurate record of the work of all students in the university, stores the same in fireproof safes, and makes them available through transcripts upon demand. He also keeps a careful record of the graduates of the university and renders invaluable service to the educational life and problems of the student. During the school year 1932-33

the personnel of the registrar's office consisted of 1 chief clerk and 7 clerks.

University health service.—The Howard University health service was operated during the school year 1932-33 by 1 full-time physician and 2 part-time physicians, 1 of whom was a woman; 2 nurses, a secretary, and 3 part-time student orderlies. In addition to the central office in the Gymnasium Building, the department maintained an infirmary in both the men's and women's dormitories, the men's infirmary being an addition of this year. The department also enjoyed the cooperation of the staff and the use of the facilities of the Freedmen's Hospital and the Howard University medical, dental, and pharmaceutical colleges. Special use was made of the X-ray unit in the medical school and of a basal metabolism testing booth set up there just as the school year closed.

Complete physical examinations of entering students were made with a tuberculin skin test for tuberculosis with X-ray follow up, and a hearing test was made on all incoming male students. The hearing test and the Wassermann work were new this year.

The athletes of the university were examined at the beginning of each sport season and a physician was present at all contests for advice and care of accidents. Twenty-five applicants for the summer camp of the Reserve Officers Training Corps were inoculated against typhoid and para-typhoid fever, and vaccinated against smallpox.

The care of illnesses in the university included 4,000 office consultations with treatment, 30 women in the women's infirmary, 25 men in the men's infirmary, and 10 hospital cases.

The health of the university presented few outstanding problems. Mild epidemics of influenza and chicken pox were controlled. Illnesses were definitely confined to early stages of disease through vigorous care. Contagion was isolated, whenever it appeared, and only one death was caused—scarlet fever—in which case the parents furnished medical care.

The staff of the university health service is allied with the American Association of School Physicians and the American Student Health Association.

Deans of men and women.—The dean of men and the dean of women supervise the housing of students, both in the dormitories and in the city, and undertake programs of social guidance related to all the extra-curricula activities of students and their choice of careers. They also endeavor to help students with their personal problems. Both of these offices report acute distress among the students on account of the depression. Both endeavored, as usual, to relieve this distress by securing part-time employment for students in need. The efforts of the dean of women this year were successful within the walls of the university alone, where, in various divisions, approximately 100 part-time positions were available. The dean of men

found himself confronted with a drastic reduction in work opportunities available for needy students outside the university walls. During the years 1927-29 he was able to secure an average of \$40,000 worth of work per year for male students. During the year 1932-33 it was possible to secure only \$1,200 worth of new work for students. Many of the male students continued on old jobs at greatly reduced wages. In many cases where students once received \$20 a month and board, during the past year they received board only. Both the dean of men and dean of women report a superior scholastic record among students occupying the dormitories and both draw attention to the need for greatly increased amounts available for scholarships and student aid.

Staff.—The staff of the office of the dean of women for the school year included 2 directors of residence, 1 housekeeper, and 1 dietitian. The staff of the dean of men included 1 part-time assistant to the dean of men, 1 social director, and 1 housekeeper (part time).

THE LIBRARY

During the year 1932-33, 7,387 volumes were added to the library of the university, bringing the total library accessions in all divisions up to 78,849 volumes, exclusive of pamphlets estimated at 35,000. Four hundred and ninety-eight periodicals are currently received by subscription.

Moorland Foundation.—The Moorland Foundation, completing a very successful year of library service in the field of Negro literature, has outgrown its present quarters and has extended its shelves into the third-floor stacks. There are now 6,499 items, including 3,528 books and 2,971 pamphlets. On March 7, 1933, 883 volumes had been added. Many were contributed by the founder. The main room was used by 784 readers.

Use of the library.—The general library circulated 54,797 volumes during the year, with a daily average circulation of 182. The medical library reported a circulation of 36,986 volumes. The law library loaned 164 volumes. Dentistry circulated 2,032 volumes. In the Moorland room, 1,182 books were used.

Veterans' Bureau gift.—From the generous gift of books from the war-time Veterans' Bureau collection made by the Federal Government, 8,357 volumes have been loaned during the year to 10 educational institutions.

Further development of the library.—The general library has need of more space, more help, and more money for books. The present building has reached and passed capacity for accommodating the books, staff, faculty, and students of the university. This is now a matter of common knowledge in the educational world which is interested in the growth of Howard University.

BUILDINGS AND GROUNDS

The following table shows the building projects by number, authorized by the Government, and in process during the year 1932-33.

Building program in process, 1932-33

No.	Description of project	Date authorized	Authorized limit of cost	Total amount appropriated
2	Construction and equipment of a chemistry building-----	May 4, 1929	\$399,000	\$390,000
4	For excavation, grading, walks, walls, fencing, landscaping, etc., of university grounds.	Feb. 6, 1931	200,000	200,000
5	Construction and equipment of a general library building.	Feb. 14, 1931	800,000	800,000
6	Reconstruction of underground system of distributing heat, light and power, etc.	Feb. 14, 1931	225,000	225,000
7	For completing the construction of an educational classroom building.	Feb. 14, 1931	460,000	460,000
8	For the construction and equipment of a heat, light, and power plant.	Feb. 17, 1933	460,000	460,000

FINANCES

Financial administration.—The administration of university finances was thoroughly reorganized during the year. The office of secretary-treasurer was divided into the two offices of secretary and treasurer, the secretarial office being retained by the former secretary-treasurer, and a new treasurer was elected. All finances and business administration of the university were concentrated in the treasurer's office which was re-defined by trustee statute. The entire financial system of the university was surveyed by experts and the system of accounting revised to conform with a system agreed upon by the American Association of Colleges. All trustee committees formerly engaged in financial supervision of any sort were combined in the finance committee, whose duties and powers were re-defined.

The total assets of the university at June 30, 1933, were \$6,277,982.25 exclusive of unexpended balances of Government appropriations for the chemistry building, the classroom building, the library, and the heat, light, and power plant, all temporarily impounded by the Federal Government. Of the total assets \$1,073,453.72 represented assets in a physical plant-extension fund made available from private sources; \$860,884.47 represented endowment; \$4,078,422.87 represented plant-fund assets. The remainder represented assets of the current fund.

Economical administration made possible an excess of income over expenditures in the amount of \$23,654.88, applicable to the retirement of the accumulated deficit.

The auditing of all of the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress were expended under the supervision of the Department of the Interior.

FREEDMEN'S HOSPITAL

(W. A. WARFIELD, M.D., Surgeon in Chief)

During the last fiscal year, the wards of Freedmen's Hospital were filled to capacity and frequently applicants in need of hospitalization could not be received, there being no beds available.

The same administrative difficulties experienced in former years on account of the Saturday half-holiday still exist. The hospital must function 24 hours a day and seven days a week, and with the present force it has been found impossible to comply literally with the terms of the law. This condition is most acute with the force of employees in the power plant during the winter months, and with the nursing department during the entire year.

PATIENTS

At the close of the last fiscal year there were 230 patients remaining in the hospital. During the year, 4,909, including births, were admitted, making a total of 5,139 indoor patients under care, as against 4,928 the preceding fiscal year.

Of the number admitted, including births, 738 were pay patients, 1,326 were indigent residents of the States, and 2,845 were indigent residents of the District of Columbia. There were discharged during the year, including births, 4,888, of whom 2,388 had recovered, 2,016 improved, 168 unimproved and 316 died, leaving 251 in the hospital July 1, 1933, of which number 31 were pay patients, 73 indigent residents of the States, and 147 indigent residents of the District of Columbia.

Notwithstanding 32 percent of the deaths occurred within 48 hours after admission, the mortality rate was only 6 percent for the year. Autopsies were performed on 32.2 percent of all deaths. There were 2,019 surgical operations, of which number 967 were major in character. In the dental department 1,951 received treatment. Nine thousand three hundred and nineteen were treated in the out-patient department and 7,191 in the emergency department, making a total of 16,510.

The following table shows the number of visits to the various clinics:

Clinic	Number of visits	Clinic	Number of visits
Dermatology.....	3,650	Oral surgery.....	248
Ear.....	333	Orthopedic.....	3,261
Nose.....	279	Pediatric.....	2,010
Throat.....	2,146	Prenatal.....	263
Eye.....	1,442	Postnatal.....	1,334
Urological.....	7,866	Surgical.....	9,327
Gynecological.....	3,186	Tubercular.....	250
Medical.....	5,474	Total.....	41,979
Neurological.....	910		

The total number of patients receiving the benefits of the hospital was 21,649, or 1,437 more than the preceding year.

SOCIAL SERVICE

In reviewing the work of this department for the past year, it appears that much has been done toward strengthening the foundation laid in its first 2 years of existence. In September a new educational program began to function with two of our recent graduate nurses. Both students adjusted themselves admirably to the program in teaching prevention and health conservation.

DIETARY DEPARTMENT

Considerable progress has been made in this department, especially along educational lines in the Out-patient Department Clinic. The interne dietitian's course was approved by the American Dietitian Association. The demand for dietary service is far greater than the present force can satisfy. Two additional dietitians are urgently needed.

NEEDS

The outstanding and most urgent need of the hospital is a larger personnel. It is a problem of long standing and is steadily becoming more acute. This is particularly true in the nursing service and power plant.

The graduate and student nurses work from 44 to 52 hours a week, exclusive of class and hours of study. The remedy can only be found in the employment of 17 additional graduate nurses at \$21,420 per annum, who should carry the greater part of the nursing load if the patients are to receive the best of care and the training school is to measure up fully to the present-day demands of nursing education.

The service is greatly in need of an electrician at \$1,680 per annum. There are more than 60 motors of various sizes and many electrical appliances—lighting and power circuits—in the institution requiring

the attention of an electrician. The engineer, who has some knowledge of electrical work, has labored many extra hours in this kind of service to keep the plant going, which takes him from the engine room many times when he is needed there.

Two additional firemen at \$2,640 per annum would enable the hospital to comply with the 8-hour law. A clerk at \$1,440 is urgently needed in the social service department. This branch of the hospital service has two workers with no regular clerk. When possible a clerk is detailed from some other department for an hour or so each day, which is in no way satisfactory to either service.

THE SCHOOL OF NURSING

The nursing service during the past year has been good. The addition of the pediatric ward and the new clinical building have greatly increased the facilities for the training of student nurses. This service has been considerably handicapped on account of the great amount of illness among the student nurses. This has been attributed to the heavy nursing load, long hours on duty, and a large class schedule.

Statistical summary

	1933				Total	1932					
	Colored		White			Colored		White			
	Male	Female	Male	Female		Male	Female	Male	Female		
In hospital July 1, 1931-----											
In hospital July 1, 1932:										42	
Pay patients	16	18			34						
Indigents:											
United States-----	38	41			79	30	38			68	
District of Columbia-----	64	53			117	31	47			78	
Total-----	118	112			230	85	103			188	
Admitted:											
Pay patients	253	418	1		672	274	442	2		718	
Pay patient births-----	32	34			66	46	32	1	1	80	
Indigents:											
United States-----	407	761	3		1,171	553	671	3	1	1,228	
District of Columbia-----	878	1,429	10	2	2,319	892	1,248	5	2	2,147	
Births:											
United States-----	74	81			155	131	98	1		230	
District of Columbia-----	252	273		1	526	164	173			337	
Total admitted-----	1,896	2,996	14	3	4,909	2,060	2,664	12	4	4,740	
Total indoor under care-----	2,014	3,108	14	3	5,139	2,145	2,767	12	4	4,928	
Stillbirths:											
Pay patients	1	2			3	3	3			6	
Indigents-----	30	27			57	33	25			58	
Total-----	31	29			60	36	28			64	
Discharge, including births:											
Pay patients:											
Recovered-----					397					390	
Improved-----					283					335	
Unimproved-----					9					21	
Total-----					689					746	
Indigents:											
Recovered-----					1,991					1,866	
Improved-----					1,733					1,591	
Unimproved-----					159					148	
Total-----					3,883					3,605	

Statistical summary—Continued

	1933				1932					
	Colored		White		Total	Colored		White		
	Male	Female	Male	Female		Male	Female	Male	Female	
Deaths:										
Pay patients.....	27	24	1	—	52	34	26	—	60	
Indigents.....	137	127	—	—	264	133	152	2	287	
Total.....	164	151	1	—	316	167	178	2	347	
Grand total discharges.....	—	—	—	—	4,888	—	—	—	4,698	
In hospital July 1, 1933:										
Pay patients.....	13	18	—	—	31	16	18	—	34	
Indigents:	—	—	—	—	—	—	—	—	—	
United States.....	26	46	1	—	73	38	41	—	79	
District of Columbia.....	62	85	—	—	147	64	53	—	117	
Total.....	88	131	1	—	220	102	94	—	196	
Grand total remaining.....	101	149	1	—	251	118	112	—	230	
Day's maintenance:										
Pay patients.....	—	—	—	—	11,237	—	—	—	19,616	
Indigents:	—	—	—	—	—	—	—	—	—	
United States.....	—	—	—	—	24,498	—	—	—	25,897	
District of Columbia.....	—	—	—	—	49,301	—	—	—	36,110	
Total.....	—	—	—	—	85,036	—	—	—	81,623	
							1933	1932		
Cost per patient per day.....	—	—	—	—	—	—	\$3.10	\$3.56		
Largest number of indigents at any one time.....	—	—	—	—	—	—	249	232		
Smallest number of indigents at any one time.....	—	—	—	—	—	—	168	130		
Daily number of patients, pay and indigent.....	—	—	—	—	—	—	232	225		
Average number of days' hospitalization per patient.....	—	—	—	—	—	—	16.48	15.28		
Daily average number of patients, outdoor.....	—	—	—	—	—	—	138	113		
Number of indigents admitted from District of Columbia, including births.....	—	—	—	—	—	—	2,845	2,480		
Number of prescriptions compounded:	—	—	—	—	—	—	—	—		
Indoor.....	—	—	—	—	—	—	34,297	32,043		
Outdoor.....	—	—	—	—	—	—	22,397	18,083		

FINANCIAL STATEMENT*Receipts and disbursements on account of pay patients*

	1933	1932
RECEIPTS		
Private-room patients, at \$2 per day.....	\$6,332.00	\$7,076.00
Ward patients, at \$2 per day (Veterans' Administration).....	7,128.00	8,884.00
Ward patients, at \$1.75 per day.....	7,134.25	8,333.50
Children, at \$1 per day.....	168.00	168.00
Babies, at 50 cents a day.....	209.00	299.00
Use of operating rooms.....	1,407.00	1,322.00
X-ray photos (including \$520 for Veterans' Administration patients).....	1,155.00	1,447.00
Other charges (including \$278 for Veterans' Administration patients).....	453.00	755.00
Total.....	23,986.25	28,284.50
DISBURSEMENTS		
Subsistence.....	—	2,979.98
Medical and surgical supplies.....	4,051.35	4,163.04
Miscellaneous (dry goods, repairs, fuel, etc.).....	18,030.17	20,278.46
Refund of overpayment by patients.....	209.25	282.25
Total.....	22,290.77	27,703.73
Unexpended balance.....	1,695.48	580.77

Receipts and disbursements, 1933

RECEIPTS

Appropriation, Interior Act:	
Salaries.....	\$198,980.00
For support.....	94,500.00
	<hr/>
Second Deficiency Act, 1932.....	293,480.00
From pay patients.....	75,052.59
From Veterans' Administration.....	15,418.25
From Howard University.....	8,568.00
	<hr/>
Total.....	429,797.99

DISBURSEMENTS

Miscellaneous, appropriation (fuel, light, clothing, medicine, etc.).....	44,885.29
Miscellaneous, pay patient (fuel, light, clothing, medicine, etc.).....	14,426.54
Miscellaneous, Veterans' Administration (fuel, light, clothing, medicine, etc.).....	7,654.98
Miscellaneous, Howard University (fuel, light, clothing, medicine, etc.).....	35,898.97
Subsistence appropriation.....	48,732.13
Salaries.....	171,623.45
Clinical addition.....	74,698.12
Refunds, pay patients.....	209.25
	<hr/>
Total.....	398,128.73

UNEXPENDED BALANCE

Miscellaneous appropriation.....	614.71
Subsistence appropriation.....	267.87
Salaries (including \$24,383.49 furlough and compensation deductions).....	27,356.55
Pay patient.....	782.46
Veterans' Administration.....	913.02
Howard University.....	1,380.18
Clinical addition (including \$304.82 furlough and compensation deductions).....	354.47
	<hr/>
Unexpended balance, total.....	31,669.26

COLUMBIA INSTITUTION FOR THE DEAF

(PERCIVAL HALL, M.A., Litt.D., President)

During the fiscal year ending June 30, 1933, there were under instruction in the advanced department of the institution, known as Gallaudet College, 85 men and 64 women, a total of 149, representing 33 States, the District of Columbia, and Canada. This is an increase of one as compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 38 boys and 27 girls, a total of 65. This is an increase of one as compared with the preceding year. Of the total in this department 63 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 32 males and 30 females; discharged, 24 males and 23 females.

The health of students and pupils during the year has been excellent. Preventive measures are taken regularly in connection with more serious contagious diseases which have kept our student body free from most of such troubles. One case of tuberculosis was discovered during the year and sent to a sanitarium for private treatment. A few surgical cases, including 1 fractured clavicle and 1 fracture of the small bone of the leg, were successfully treated.

Continued care was given to the production of our milk supply. A modern outfit for the sterilization of all cans and bottles used at the dairy was installed, and regular weekly examination of the milk product for bacteria was continued. The usual physical training of all students was continued under competent instructors. The regular courses of study both in Gallaudet College and in the Kendall School remained unchanged during the year.

NEEDS OF THE INSTITUTION

Attention has been called during the past few years to the need of a building for library and instruction purposes, which would relieve crowding in the men's dormitory, provide more recitation rooms, and better accommodations for our print shop and our valuable library. It has been 15 years since any serious building project has been undertaken. This building should be erected in the near future, and an addition made to the gymnasium, which is now about 50 years old, so that it may accommodate modern basketball contests. There is further need for dormitory space for the pupils of the Kendall School,

a new shop building, and an addition to the laboratory; also a new primary recitation building. The grounds should be surrounded by a modern steel fence on all except the Florida Avenue frontage.

The salary scale of the employees has never been as high as it should be. Many of our workers are experts in the instruction of the deaf, and could command higher salaries in other institutions. The restoration of the old wage level should be made as soon as possible, and readjustments in addition to this should place our teaching force at least on a par, in this respect, with any similar institution.

A research department should be established to study problems of the deaf as urged by the Conference of Executives of American Schools for the Deaf, the Convention of American Instructors of the Deaf, and the National Research Council. At the present time one research worker, supported by the National Research Council, has been making important studies as to the motor coordination of deaf children compared with hearing persons. This, however, is only a temporary arrangement.

Combined statement of the disbursing officer and the treasurer of receipts and expenses for the fiscal year ended June 30, 1933

RECEIPTS

	Appropriated funds	Special de-	Total
United States appropriation.....	\$128,000		\$128,000.00
Payment by District of Columbia.....		\$31,500.00	31,500.00
Sundry receipts.....		14,237.38	14,237.38
Balance on hand July 1, 1932.....			
Total.....	128,000	45,737.38	173,737.38

EXPENSES

	Appropriated funds	Special de-	Total
Personal services.....	\$75,787.16	\$23,117.83	\$98,904.99
Supplies and materials.....	27,785.68	7,253.49	35,039.17
Subsistence and support of persons.....		47.00	47.00
Subsistence and care of animals, etc.....		11.25	11.25
Communication service.....	1,503.64	292.91	1,796.55
Travel expenses.....	28.00	172.28	200.28
Transportation of things.....	51.25	37.34	88.59
Printing and binding.....		234.62	234.62
Advertising and publication of notices.....		4.24	4.24
Furnishing heat, light, etc.....	346.70	48.79	395.49
Rents.....		319.77	319.77
Repairs and alterations.....	12,643.03	7,924.62	20,567.65
Special and miscellaneous.....		278.50	278.50
Equipment.....	1,986.57	2,568.96	4,555.53
Stores purchased for resale.....	257.26	1,289.62	1,546.88
Total.....	120,389.29	43,601.22	163,990.51
Total.....	120,389.29	43,601.22	163,990.51
Impounded in Treasury.....	7,109.18		7,109.18
Reserve returned to Treasury.....	501.53		501.53
Balance on hand July 1, 1933.....		2,136.16	2,136.16
Grand total.....	128,000.00	45,737.38	173,737.38

INVESTED FUNDS

General fund:	
Balance on hand July 1, 1932.....	\$1,047.18
Receipts from coupons and interest.....	201.10
Total.....	1,248.28
Expenses for bond of treasurer and tax on checks.....	113.23
Balance in banks June 30, 1933.....	1,135.05
Manual-labor fund:	
Balance on hand July 1, 1932.....	1,446.10
Interest on savings account and receipts from coupons.....	153.60
Total in banks June 30, 1933.....	1,599.70
Memorial art fund:	
Balance on hand July 1, 1932.....	251.95
Interest on savings account and receipts from coupons.....	13.54
Total in banks June 30, 1933.....	256.49
A. B. Greener fund:	
Balance on hand June 30, 1932.....	4.83
Interest and receipts from coupons.....	1.02
Total in banks June 30, 1933.....	6.85

GALLAUDET MEMORIAL BUILDING FUND

The assets of the Gallaudet Memorial Building Fund, in the hands of the treasurer of the institution, are as follows:

Cash in banks:	
Restricted.....	\$1,591.40
Conservators account.....	611.00
Mortgage notes receivable, face value.....	2,202.40
Bonds, par value.....	23,722.50
Total.....	28,000.00
	53,924.90

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